

THE IRON AGE^v

New York, Thursday, April 7, 1910.

LANDSEN STORAGE BATTERY TRUCKS.

Industrial Motor Cars for Short Hauls.

Industrial trucks for interworks and factory service operated by storage batteries may have advantages in some cases over such less flexible transporting systems as industrial railways or conveyors. The Lansden Company, 54-56 Lackawanna avenue, Newark, N. J., has recently made some types of industrial trucks that are being used in connection with the Edison storage battery to excellent advantage. For interior use the company recommends a four-wheel type of truck,

springs are also used over the rear axles of the truck. The three-wheel truck can turn in a circle of very small diameter, and the platform is built only 27 in. from the ground, which saves work in loading and unloading. The height from the ground of the average electric truck has been one of the principal objections to their use where heavy goods are to be handled on them, whereas flat cars as used on industrial railways can be built very low to the ground.

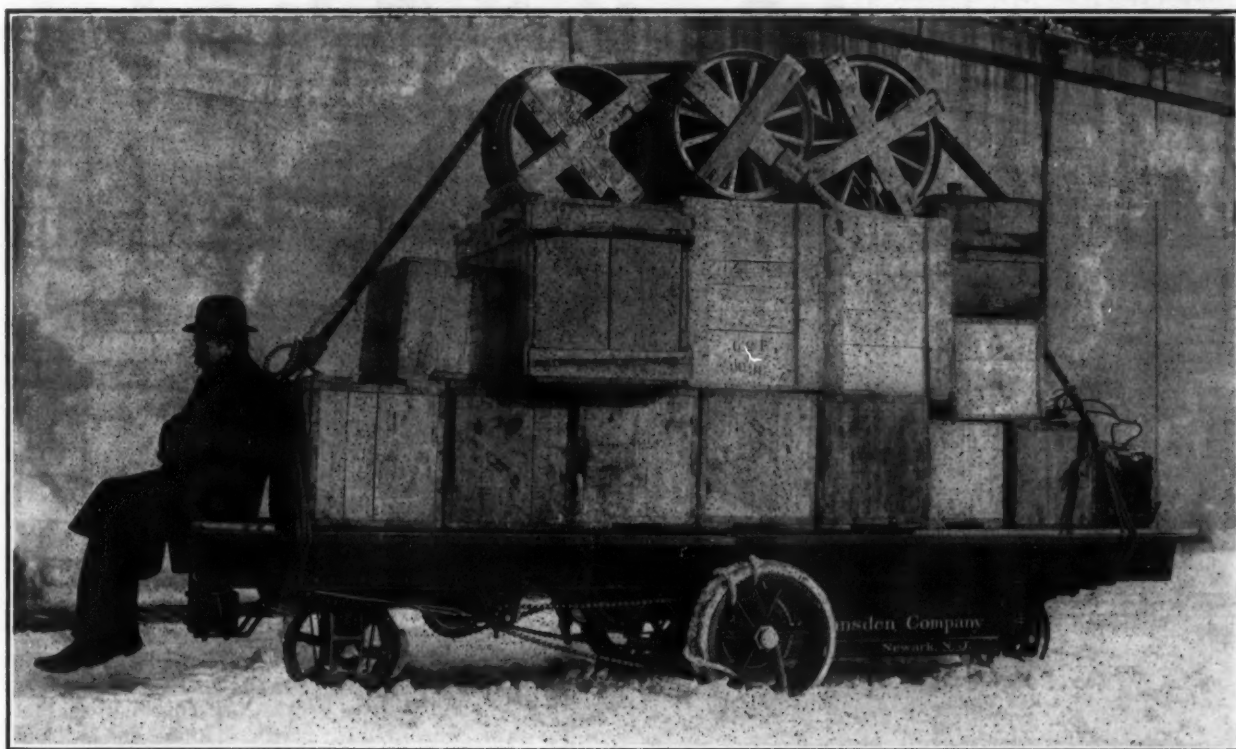


Fig. 1.—A Standard Four-Wheel Truck, Built by the Lansden Company, Newark, N. J., Carrying a Load of Tin Plate and Automobile Wheels.

which is practically a combination of two of the company's standard three-wheel trucks, that are adaptable to smaller loads. The standard three-wheel trucks, designed for moving materials short distances at low speed and low cost, are operated over all sorts of pavements and floors and can be easily driven by a workman of average intelligence, as the operation is simple and can be readily understood.

One of these trucks is shown in Fig. 3 loaded with heavy hardware. The vehicle is operated in a New England plant and has been in use several months without a breakage of any kind. This type has a short wheel base and is designed so that it can be run upon elevators. The three-point base permits it to accommodate itself to a rough riding surface without unusual strain. A single motor drives a differential countershaft by a single chain, and the final drive is by side chains from the ends of the countershaft to the rubber tired driving wheels. The steering wheel has a steel rim without a tire and is mounted together with its coil springs on a pedestal on a turntable forming a steering unit controlled by a hand wheel. Coiled

The most recent development in the Lansden cars has been the production of the four-wheel industrial truck, which is an amplification of a three-wheel truck intended for similar purposes. The four-wheel truck is practically two three-wheel trucks placed back to back at what would ordinarily be the driving-wheel ends of the two trucks. The joint is made flexible, allowing the center of the platform to rise and fall so that when the wheels strike depressions in the road surface there is no strain on the load platform. The steering wheels of the four-wheel truck are cross connected underneath by rods and chains, as shown in the accompanying top view of the standard truck, Fig. 2, and they work in unison, turning in opposite direction to equal angles. This makes it possible to control the truck from either end, and it will turn nearly in its own length. The four-wheel trucks are 6 ft. 4 in. wide and 14 ft. long, while the three-wheel truck is 4 ft. wide and 10 ft. long. The standard four-wheel trucks will carry a 4000-lb. load at a speed of $4\frac{1}{2}$ miles per hour, and the battery charge will last 18 miles of running. The car can be equipped with extra battery

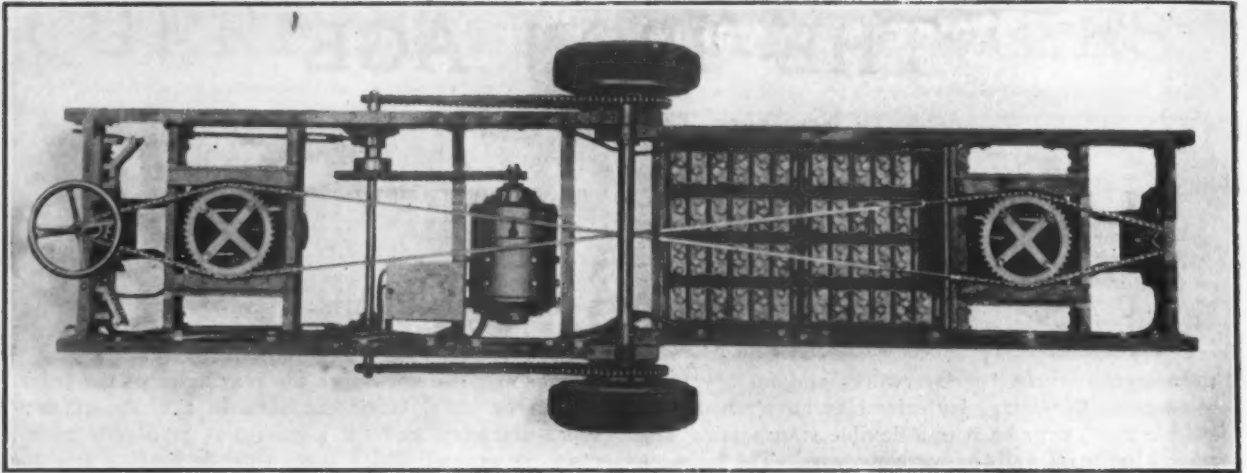


Fig. 2.—Top View of a Standard Four-Wheel Truck, with Platform Removed.

capacity to run 24 miles. The cost of current for operating the truck averages about 50 cents a day on a standard truck.

A four-wheel machine is shown in Fig. 1, carrying a load of tin plates and automobile wheels from the railroad freight yards to the Lansden Company's plant in Newark. This machine can be run directly into the building and unloaded by a crane. Another type of four-wheel truck which is of special design is made by the company to be used where there is an objection to the use of the metal-rim wheel, or where long outside runs would make an all-rubber tired machine more desirable. One of these machines now in use at the Yonkers, N. Y., works of the Otis Elevator Company, is shown in Fig. 4. This

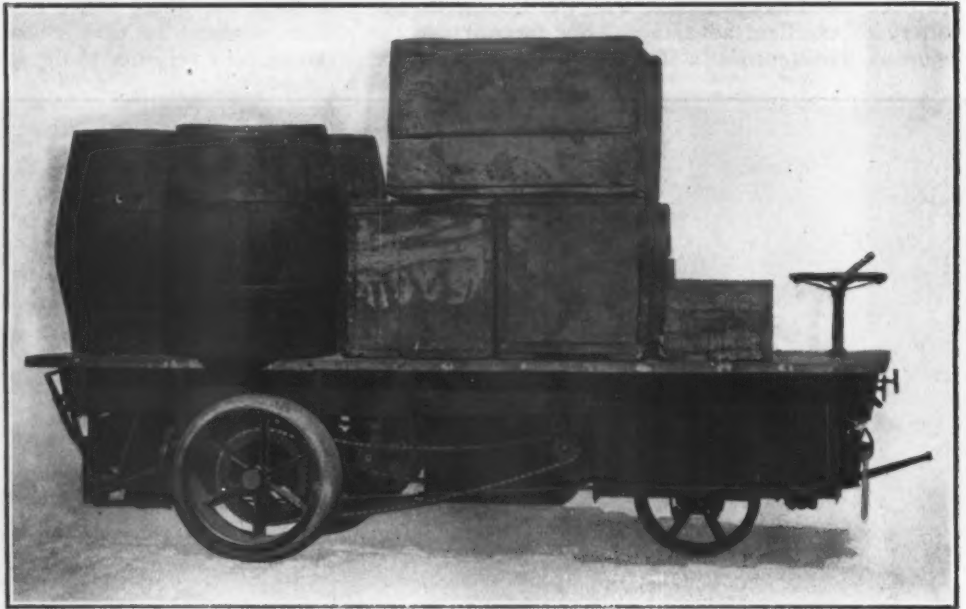


Fig. 3.—A Three-Wheel Truck Loaded with Heavy Hardware. This Truck Has Been in Operation in a New England Plant for Several Months Without any Breakdowns.

machine is carrying a load of 7580 lb. and is capable of carrying an 8000-lb. load. It is built the same size as the three-wheel truck but is especially strong. The steering arrangement is in a measure similar to that of the three-wheel truck, except that the entire front axle turns. The machine is built for special cartage purposes, and is used to carry elevator machines and parts from the upper floors of the factory building to the street and deliver them to the railroad freight house two blocks away. The truck can be run from the elevator in the building to the various floors to be loaded with the different parts of an elevator which is to be shipped complete, and its use in this plant saves a great deal of freight handling.



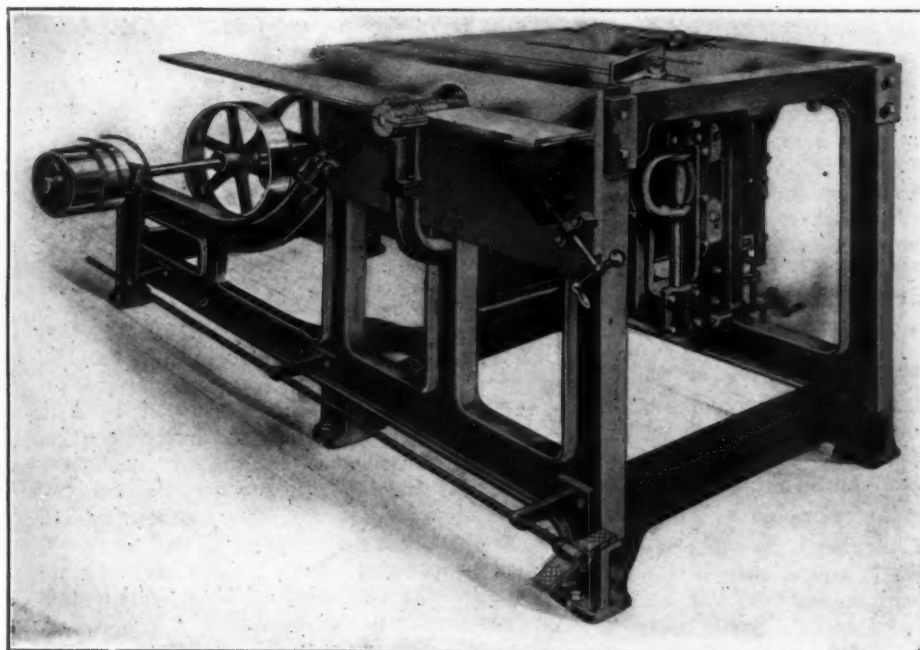
Fig. 4.—A Special Four-Wheel Truck in Use at the Otis Elevator Works, Yonkers, N. Y. The Load Is 7850 Lb.

The Ohio Welding & Mfg. Company, 828-830 West Sixth street, Cincinnati, Ohio, has arranged to act as dealer for the Davis-Bournonville Company, New York. The new company has installed a large demonstrating plant, including not only the welding equipment, but also an oxygen plant, and will take in all classes of repair work to which the oxy-acetylene process can be applied. This will include broken or cracked parts in cast iron, steel, aluminum, brass, copper, German silver, platinum, malleable iron, &c. Furthermore, parts cut too short can be lengthened and parts worn beyond use can have metal added and dressed down. The Ohio company will also shortly open a demonstrating and repair shop in Cleveland, Ohio, at 2121 East Second street, Southeast.

The Economic Woodworker.

Combines a Variety of Functions.

This machine, which is made by Loveland & Monahan, 527 West Jackson Boulevard, Chicago, Ill., and shown in the accompanying illustration, is in reality a complete equipment of heavy woodworking machinery. It consists of the following distinct machines combined in one unit: Variety saw table, jointer, shaper or edge molder, boring and mortising machine and router, while if desired by the use of extra attachments it may be converted into a disk sander and emery grinder. The machine is of particular interest to contractors and builders, carpenter shops, wagon, automobile and blacksmith shops, sash and door factories and to other woodworkers. It is also particularly adaptable for use as an auxiliary machine in general factory work, and for builders it is mounted on a suitable truck so that it may be moved from job to job as occasion may require.



The New Economic Woodworker, Built by Loveland & Monahan, Chicago, Ill.

The particular advantages claimed for the machine are its strength of construction, elimination of changes when passing from one class of work to another, ability to do heavy work and to rip and joint in practically the same operation.

The frame is of iron of I-beam and channel design and is strong, rigid and symmetrical. All the parts are securely fastened, and it is claimed that there is absolutely no vibration. The countershaft is self-contained and is located at such a distance from the driven pulleys as to secure the proper amount of tension for the belt. The shaft is equipped with tight and loose pulleys and apparatus for shifting the belt. The three spindles are of carefully turned and ground high grade crucible steel and run in long self-oiling bearings lined with babbitt.

The saw table measures 36 x 48 in., and is of iron braced with ribs and machined for accurate work. The adjustment is by the hand screw shown in front of the machine, and the table can be clamped in any desired position. Two cross cutting and one ripping gauge are furnished so that the machine may be used for either kind of sawing. The latter is of the manufacturer's latest improved design and can be adjusted to any angle for beveling. Any diameter of saw up to 24 in. can be used, and the slot is of sufficient width to allow the use of a dado or grooving head. The table can, therefore, it is stated, be used satisfactorily for a number of operations besides sawing.

The shaper and router is of the customary single spindle type, and the spindle runs in extra long babbitt lined boxes and is securely supported at the bottom. The yoke is heavy and stiff enough to hold the spindle perfectly true regardless of the height to which it may be raised. The spindle and its support are raised and lowered in a dovetailed slide by a hand screw. When not in use the spindle can be sunk below the table and a circular plate fitted into the aperture, thus making a perfectly flat table top. A complete set of collars is provided for each shaper. The router bit fits into a hole on top of the shaper spindle and will do very heavy work. Molding, tonguing, grooving, matching, beading and shaping irregular work with and against the grain can all be done by this shaper, and if desired an additional head for sash sticking can be furnished.

The jointer is furnished in two sizes, the table being 60 in. long and either 6 or 14 in. wide. This great length and a secure method of fastening throughout, it is stated, eliminates any vibration. The cutter head is forged from crucible steel and is slotted on four sides. The jointer is equipped with an improved tilting fence, which can be set at any necessary angle for beveling, and in addition it may be used for any kind of straight planing, squaring up, taking out of wind, cornering, rabbeting and making accurate glue joints. The tables of both sizes are adjustable for height and also for wear. The boring and mortising machine is of the horizontal type, and is capable of adjustment both horizontally and vertically. Any size of bit desired

may be used, and they fit into the end of the saw mandrel.

The following table gives the dimensions and specifications of the machine:

Size of saw table, inches.....	36 x 48
Size of saw mandrel and shaper spindle, inches.....	1 7-16
Size of jointer table, inches.....	14 x 60 and 6 x 60
Size of boring machine table, inches.....	18 x 10
Speed of countershaft, revolutions per minute.....	900
Diameter tight and loose pulleys, inches.....	8
Power to operate, horsepower.....	4 to 5
Extreme floor space, inches.....	60 x 96
Net weight, pounds.....	1,500
Shipping weight, pounds.....	1,800

The standard equipment furnished for this machine is one rip saw, one crosscut saw, one set of jointer knives, one set of shaper knives, three boring bits and the necessary belting.

The Brown Instrument Company, successor to Edward Brown & Son, 311 Walnut street, Philadelphia, Pa., manufacturers of the Brown pyrometers and revolution recorders, announces the change in its name to the Brown Instrument Company. The officials of the company are exactly the same as the members of the firm of Edward Brown & Son. The new company announces the opening of an office in the Oliver Building, Pittsburgh, Pa., in charge of W. H. Gibb. The large amount of business being done in Brown instruments in the Pittsburgh district has necessitated this step.

THE SHRINKAGE OF METALS AND ALLOYS.

An Ingenious Method of Accurate Measurement—Tabulated Results With Various Non-Ferrous Groups.

A recent issue of *Metalurgie* was practically taken up with a long article by Prof. F. Wuest on the "Shrinkage of Metals and Alloys." The metals and alloys treated of are all non-ferrous and the results are of great importance to all workers in such metals and alloys.

The first thing to be done was to devise a suitable apparatus to show the very small changes in length taking place in cooling a cast bar, and at the same time give accurately the temperature of the metal under examination. A very ingenious apparatus was prepared, which is fully described with drawings. Only the barest outline can be given here. Placed at each end of the mold, so that they become fastened in the ends of the round cast bars, are two wires with cork-screw like ends. The extreme length of the bar is 21.65 in. and of the part between the wires 19.68 in. The other ends of the wires are connected by means of binding screws of hard rubber with two piston rods. The small pistons operate in cylinders, the open ends of which are connected by means of a capillary tube containing water. One part of this tube is carefully graduated, and any movement on the part of the pistons is instantly recorded. A thermo-couple suitably protected is placed in the exact center of the mold; by means of a chronographic recorder the time, temperature and contraction or expansion are obtained.

Altogether 39 metals and alloys were worked with, comprising lead, tin, zinc, aluminum, copper, bismuth, antimony and various alloys. The alloys were lead-tin, lead-antimony, tin-zinc, copper-zinc, copper-tin, copper-nickel-zinc and various commercial alloys such as white metals, Britannia metal, brass, bronze, and lastly an alloy with lead, bismuth and tin.

Analyses of Metals and the Results.

The results obtained with the metals may be classed together. With the exception of copper they all show the same type of curves. Contraction begins soon after the metal has started to freeze, proceeds partly during the freezing period, and then slowly and continuously until the metal is solid. In the case of copper there is a slight and uncertain expansion, while the metal is freezing, due to the disengagement of gases at the time of solidification. In Table I are given the analyses of the materials and in Table II the results:

Table I.—Analyses.

Metal.	Pb.	Sn.	Zn.	Fe.	Al.	Cu.	Bi.	Sb.
Lead	98.2	1.27	...	...	...	...	...	...
Zinc	...	...	97.3	2.67	...	...	...	...
Tin (banca)	100	...	...	...	...	...	...	...
Tin	99.8	...	...	...	...	...	...	...
Aluminum	...	...	...	0.33	99.16	...	...	...
Copper	...	...	...	0.35	...	99.16	...	...
Bismuth	0.12	...	...	...	...	...	99.80	...
Antimony	...	0.34	...	1.30	...	0.56	...	97.90

Table II.—Results.

Metal.	Casting temperature. Deg. C.	Freezing point. Deg. C.	Shrinkage		Total shrinkage. Per cent.
			during freezing. Per cent.	Per cent.	
Lead	500	326	0.085	0.82	
Lead	600	326	0.085	0.83	
Zinc	650	416	0.08	1.40	
Zinc	700	416	0.08	1.40	
Zinc	750	416	0.08	1.40	
Tin (banca)	550	225	0.1 to 0.15	0.44	
Tin	500	225	0.1 to 0.15	0.55	
Aluminum	800	683	...	1.78	
Aluminum	850	683	...	1.78	
Copper	1,250	1,060	Expansion	1.42	
Bismuth	500	261	...	0.29	
Antimony	710	621	...	0.29	
Antimony	750	621	...	0.63	
Antimony	800	621	...	0.29	
Antimony	1,050	621	...	0.66	

The results with the tin show the effect of a small amount of impurity. The aluminum showed a very small shrinkage during the freezing. The antimony

gave very erratic results for which no explanation can be found.

Alloys Chiefly Lead, Tin and Zinc.

In the next group may be placed the alloys of lead and tin, lead-antimony, tin-zinc, and zinc-tin with copper and lead. Their analyses are given in Table III and the results in Table IV.

Table III.—Analyses.

No.	Pb.	Sn.	Zn.	Sb.	Cu.
9	80.82	18.27	...	...	...
10	29.10	70.01	...	...	...
11	18.39	80.99	...	...	...
12	80.61	...	...	19.20	...
13	85.20	...	...	14.68	...
14	...	50.83	49.04	...	...
15	...	85.40	14.52	...	...
16	...	95.15	4.81	...	...
33	1.66	14.48	79.44	...	4.35
32	0.94	45.84	51.22	...	1.90

Table IV.—Results.

No.	Casting temperature. Deg. C.	First stopping point. Deg. C.	Second point. (Eutectic).	Total shrinkage. Per cent.
9	650	251	...	0.56
10	550	...	174	0.44
11	550	...	180	0.50
12	650	...	239	0.54
13	500	...	232	0.56
14	550	...	200	0.50
15	500	...	195	0.46
16	500	...	190	0.49
33	500	379	374	1.02
32	550	340	334	0.73

According to Kupffer the eutectic of the lead-tin alloys contains 37 per cent. lead and solidifies at 180 deg. C. The results of this work show that the nearer the alloy is in composition to the eutectic the less its shrinkage. With tin and zinc the eutectic contains 8 per cent. zinc and melts at 204 deg. C., according to Rudberg. Here again the alloy nearest to eutectic ratio has the smallest shrinkage. The last two alloys represent commercial practice. The shrinkage began shortly after the beginning of solidification and the curve was similar to that of the tin zinc alloys.

In all these cases the total shrinkage was less than that of the component metals.

Alloys Chiefly Copper and Zinc.

In the next group may be placed the copper-zinc alloys, the copper-tin alloys and the copper-nickel-zinc alloys. Here is seen a totally different type of curve, for the alloys expand after the beginning of solidification, the expansion rising to a maximum and then the alloys shrink. The analyses are given in Table V and the results in Table VI:

Table V.—Analyses.

No.	Cu.	Sn.	Zn.	Ni.	
17	83.45	...	16.24	...	Tombac yellow
18	66.60	...	32.90	...	Tombac yellow
19	63.10	...	36.24	...	Brass
20	63.93	...	35.25	...	Brass
21	94.70	5.08	...	...	Bronze
22	89.65	10.23	...	...	Bronze
23	80.66	19.08	...	...
24	61.57	...	22.16	16.10	German silver
25	56.20	...	23.36	20.40	German silver
26	51.40	...	22.30	26.22	German silver
27	46.10	...	18.00	35.80	German silver

Table VI.—Results.

No.	Temperature. Deg. C.	First point. Deg. C.	Beginning expansion.		Beginning shrinkage. age.	Per cent. shrinkage.
			point. Deg. C.	Per cent. expansion.		
17	1,000 to 1,050	993	...	1,000 0.3	973	2.17
18	950	902	...	904 0.03	870	1.97
19	950	880	...	935 0.03	879	1.99
20	900 to 1,000	881	...	990 0.033	879	1.90
21	1,050	1,035	...	1,032 0.085	786	1.66
22	995 to 1,150	996	...	980 0.122	706	1.44
23	900	...	760	835 0.01	752	1.52
24	1,100	1,020	955	1,068 0.045	917	2.025
25	1,065 to 1,090	1,060	1,025	1,049 0.039	924	2.05
26	1,100 to 1,150	1,087	890	1,080 0.027	949	2.03
27	1,170 to 1,200	1,085	...	1,090 0.032	1,010	1.935

These alloys, as opposed to the first group, consist of solid solutions instead of separate metals and eutectics. The solidification covers a more or less wide range of temperature. The expansion begins at the moment solidification begins, and as a rule the metal begins to shrink when solidification is complete. They show more shrinkage than do the component metals.

The White Metals.

In the next group may be placed the white metals. The shrinkage curves show that it takes place in two phases, the transition from one to the other being abrupt. No expansion is noticed when freezing. In Table VII are given the analyses and in Table VIII the results:

Table VII.—Analyses.

No.	Sn.	Pb.	Sb.	Cu.	
34	....	78.89	12.5	8.45	
35	19.80	58.84	21.4	...	
36	85.42	....	9.45	5.10	White metal
37	90.20	....	8.01	1.85	Britannia metal
38	70.83	9.21	15.1	4.94	Britannia metal

Table VIII.—Results.

No.	Casting temperature.	First stopping point.	Second stopping point.	Beginning of shrinkage.	Per cent. shrinkage.
	Deg. C.	Deg. C.	Deg. C.	Deg. C.	
34	600 to 650	250	230	266	0.55
35	600	263	238	247	0.49
36	500 to 550	225	...	225	0.51
37	600 to 700	228	...	226	0.55
38	550 to 600	259	187	228	0.42

Copper-Tin-Zinc Alloys.

Next come an important group of alloys of copper-tin-zinc with some lead, the last two corresponding to commercial gun-metal. The analyses and results are shown in the following tables. The cooling curves all show four arrests in the curves; and the shrinkage curves show first an expansion and then contraction.

Table IX.—Analyses.

No.	Cu.	Sn.	Zn.	Pb.
28	87.10	2.68	8.05	2.28
29	81.06	17.50	1.53	...
30	88.75	9.65	1.6	...
31	86.65	9.84	2.0	1.44

Table X.—Results.

No.	Casting temperature.	First stopping point.	Second point.	Third point.	Fourth point.	Beginning expansion.	Per cent. expansion.	Beginning shrinkage.	Per cent. shrinkage.
	Deg. C.								
28	1,000	992	895	825	685	973	0.025	840	1.76
29	950 to 1,000	873	775	737	603	854	0.024	756	1.50
30	950 to 1,020	977	990	824	745	955	0.058	728	1.47
31	1,000	965	840	778	748	944	0.075	750	1.47

In these cases also the shrinkage is higher than that of the component metals.

A most peculiar result was obtained with an alloy containing 32.47 per cent. lead, 49.88 per cent. bismuth and 17.38 per cent. tin. It began solidifying at 74 deg. C., and gave a shrinkage of 0.15 per cent., but then began expanding and finished larger than the pattern.

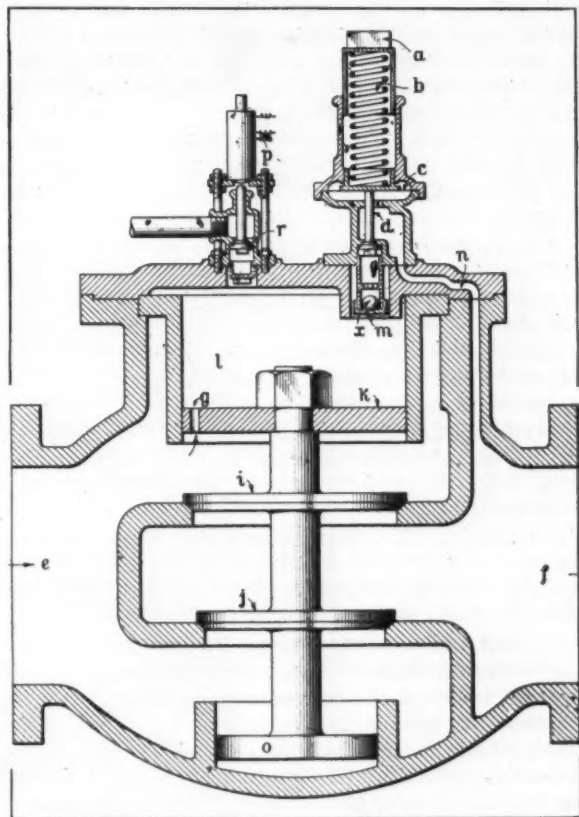
G. B. W.

The Anderson Pressure Reducing and Quick Opening Valve.

For use in situations where it is desirable or necessary to maintain a constant reduced pressure in water mains or to reduce a high pressure to a lower one for domestic distribution, the Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa., has recently brought out a new valve. In addition to reducing the water pressure to any predetermined amount, the valve is fitted with an electrically operated attachment for quickly opening the passage between the inlet and outlet passages whenever the full pressure is desired for fire fighting or other purposes.

The accompanying engraving is a sectional view of the valve in its closed position. The spring *b* controls the action of the valve, and by turning the bronze

sleeve *a*, in which it is inclosed, is adjusted to any of the pressures sanctioned by good practice. The pressure of this spring bears down on the diaphragm *c*, which controls the movement of the auxiliary valve *d* and unseats the latter. The water is admitted at the inlet port *e* and passes out at a reduced pressure through the outlet *f*. As it flows through the valve the water fills the inlet chamber and exerts pressure upon the upper and lower valves *i* and *j* and the large piston *k*. The pressure is also transmitted to the chamber *l* through the port *g*, and as the auxiliary valve *d* is held open by the pressure of the spring above it, the water flows on toward the low pressure outlet through the passage *n*. As soon as the pressure on the low pressure side of the valve exceeds that for which the



The Anderson Cushioned Water Pressure Reducing and Quick Opening Electrically Operated Valve, Manufactured by the Golden-Anderson Valve Specialty Company, Pittsburgh, Pa.

spring *b* is set, this excess forces the diaphragm *c* upward, thereby compressing the spring and permitting the valve *d* to close. The main valves *i* and *j* are forced against their seats by the pressure above them and shut the water off from the system connected with the valve. The pistons *o* and *k* operate in dash-pots, which produce the cushioning effect common to all the valves made by this company and prevent chattering.

The quick opening attachment consists of a solenoid, *p*, which controls the small auxiliary valve *r*. The solenoid is connected to the switchboard at the pumping station or fire headquarters, and in case of fire or any emergency requiring the full pressure of the system, the circuit controlling the solenoid is closed. This energizes the solenoid and causes the valve *r* to open and exhaust the water from above the large piston *k*. This removal of pressure allows the main valves *i* and *j* to open instantly to their full area. When the higher pressure is no longer required the switch is opened and the auxiliary valve instantly closes and the main valves return to their pressure regulating position. To guard against any back flow of water through the port *m* a ball check, *x*, is employed to cover the port.

The Improved Hamilton-Corliss Mill Engine.

The First Engine with the New Type of Valve Gear—Installed for the Carnegie Steel Company.

An improved valve mechanism has been developed by the Hooven, Owens, Rentschler Company, Hamilton, Ohio, and the first mill engine to be equipped with it has been installed in the Clairton Works of the Carnegie Steel Company, at Clairton, Pa. This is a 42 and 78 x 60 in. engine and is located in the engine room adjoining the mill building. It drives through direct connection the new 22-in. mill which started rolling beams on January 26 last. The engine is a tandem compound condensing Hamilton-Corliss engine of extremely heavy and massive design and weighs approximately 400 tons. At 85 rev. per min. and with steam at a pressure of 150 lb. its rated capacity is 4000 hp. Its maximum capacity is 6500 hp. The bed plate is made in one piece and weighs about 80 tons and the flywheel is 20 ft. in diameter and weighs 90 tons.

The tendency toward high rotary speeds in rolling mill practice demands of the engine builder the best he can offer in design and material, the frequent violent changes of load from practically nothing to 50 or even 100 per cent. overload being a severe tax. Any failure on the part of the engine which may cause a temporary shutdown means such a pecuniary loss that the mill engineer demands an amount of material per horsepower which is unknown in any other class of work.

A cross sectional view of the engine is given in Fig. 1. From this it may be seen that the main bearing cap projects over the jaws of the bearings and forms a massive tie piece. Under the main bearing, which is 28 x 52 in., the bed is carried down into the foundation and is reinforced by two 5-in. bolts shrunk into position when hot. The walls of the bed transmitting the forces from the cylinder to the crank shaft are straight, without breaks or offsets, and are subjected to tensile and compression stresses only. The connecting rod is of the solid end type for both the crank and crosshead pins and the boxes are steel castings lined with babbitt. The crosshead is a steel casting of the box type and has adjustable babbitt lined slippers, which slide in bored guides. The low pressure piston rod is a hollow open hearth steel forging and is carried on the main and intermediate crossheads.

The low pressure piston is of the floating conical type and has one packing ring and follower. The low pressure cylinder is a single casting, with double ports in the steam and exhaust passages. The distance piece is so designed that it can be easily removed to allow access to the low pressure cylinder. It is fastened to the cylinder heads with through bolts and is supported on the sole plate at its center. Each cylinder is supported on a massive sole plate which extends under the bed plate and is securely keyed in place. A tongue fits into a groove in the sole plate, which is of assistance in replacing the cylinder should it become necessary to remove it at any time, so that there is no chance of its being out of line when replaced. The foundation bolts are close together and are carried through the full height of the bed plate, adding materially to the rigidity of the frame.

Fig. 2 is a view of the engine as installed at Clairton and Fig. 3 is a detail of the patented gravity valve gear, which is of the releasing type, without springs, and is claimed to be noiseless in its action. It has an extremely long range cut-off and positive release. The steam valves are driven directly without rocker plates. The exhaust valves are driven through

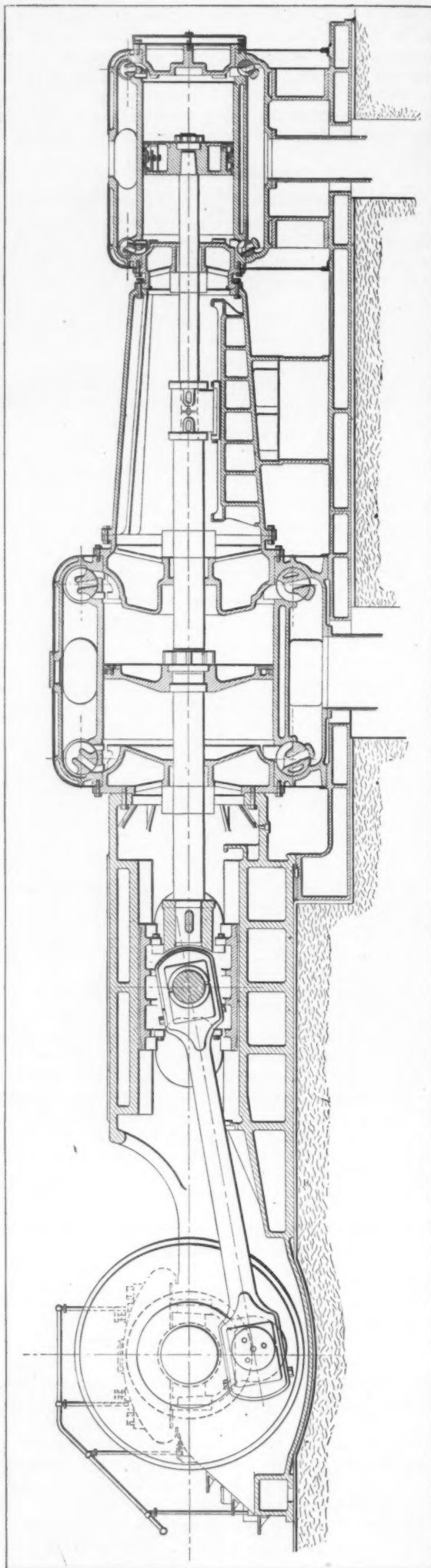


Fig. 1.—Sectional Elevation of the 42 and 78 x 60 In. Hamilton-Corliss Engine in the Clairton Works of the Carnegie Steel Company.

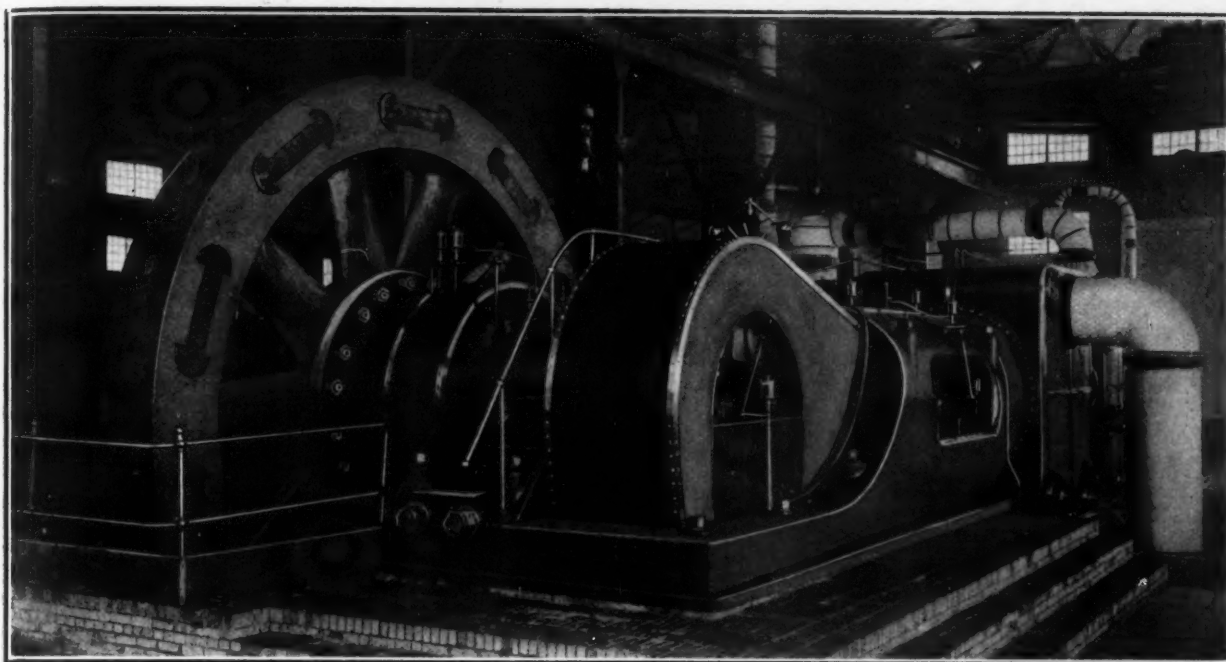


Fig. 2.—View of the Engine from the Flywheel End.

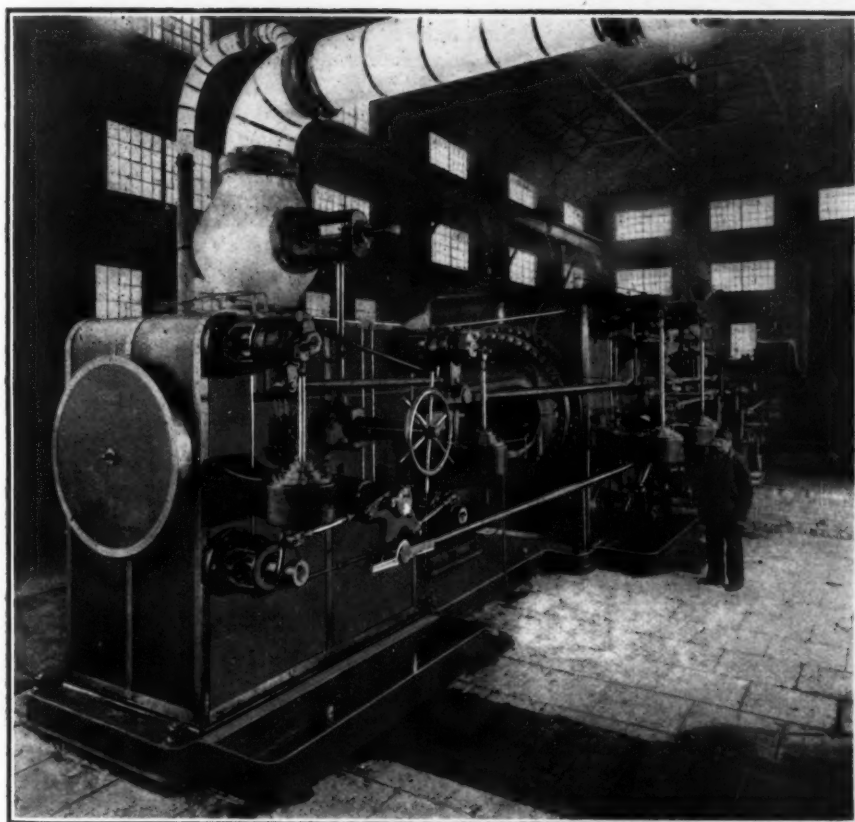


Fig. 3.—View of the Engine from the Cylinder End.

rocker plates on the side of the cylinders. The dash pots are mounted on brackets bolted to the side of the cylinder and are of a new improved type particularly adapted to this class of work. The following are the principal dimensions of the engine:

High pressure cylinder, inches.....	42
Low pressure cylinder, inches.....	78
Stroke, inches.....	60
Speed, revolutions per minute.....	85
Steam pressure, pounds.....	150
Horsepower (rated).....	4,000
Horsepower (maximum).....	6,500
Wheel diameter, feet.....	20
Wheel weight, pounds.....	180,000
Main bearing, inches.....	28 x 52
Total weight of engine, tons.....	400

The bearings of the engine are lubricated by forced gravity feed; the oil is supplied through a Bonar automatic filtering and oiling system.

The Western Steel Corporation.

At the annual meeting of the Western Steel Corporation held at Seattle, Wash., March 22, the president, James A. Moore, said that the completion of the steel plant at Irondale had been delayed by causes beyond the company's control, chiefly by belated deliveries of equipment furnished by Eastern companies. It was expected, however, that steel would be made by early May. The development of the coal properties on Graham Island would be proceeded with, it was stated, at an early date.

The election of directors resulted in the choice of the following: James A. Moore, president Moran Company, Seattle; Herbert E. Law, San Francisco; Jacob Furth, president Seattle Electric Company, Seattle; Robert Dollar, president Robert Dollar Steamship Company, San Francisco; J. E. Chilberg, president Scandinavian Amer-

ican Bank, Seattle; Alex Henderson, Governor of Yukon territory, Dawson; S. A. Perkins, proprietor *Ledger and News*, Tacoma; G. Henry Whitcomb, Worcester, Mass.; John C. Eden, president Portland Superior Cement Company, Seattle; E. P. Jamison, president E. P. Jamison Company, Seattle; N. W. Jordan, chairman American Trust Company, Boston; W. H. Armstrong, president Armstrong, Morrison & Co., Vancouver; S. G. Faulkner, president British Canadian Wood, Pulp & Paper Company, Vancouver; Robert Kelly, president Kelly, Douglas & Co., Vancouver; R. P. McLennan, president McLennan, McFeely & Co., Vancouver, and E. H. Heaps, lumber manufacturer, Vancouver. At the directors' meeting the following officers were elected: President, James A. Moore; first vice-president, Herbert E. Law; second vice-president, Jacob Furth; third vice-president,

Robert Dollar; treasurer, John Schram; secretary, David Whitcomb; executive committee, Messrs. Law, Armstrong, Jamison, Eden and Perkins, with President Moore as chairman.

The Value of Trade Papers.

How to Derive Benefit from Them.

BY ONE WHO READS THEM.

I often wonder what subscribers and others who receive various trade publications do with them. I know of some who "get them," look them over carelessly and throw them aside; their disposition, mental and other needs, possibly their capacity for acquirement of features of value, not being sufficiently pronounced to force them to a realization of the wonderful worth to-day incorporated in these publications—and in this I do not mean wholly to indicate the reading matter or editorial columns, for, from my point of view, there is not a single column in a trade paper of the present time that is uninteresting.

It is astonishing when we consider the value given to the assembled sheets of paper. How we must praise the modern progress made in the art of printing and illustrating! How few understand, when they subscribe for the average trade paper and pay the price asked for the regular sending of the publication, that their subscription, instead of meaning a profit to the publisher, actually means that the publisher is to lose money in supplying it, for the service given by the leading trade papers now costs more than the return as represented by the price of the subscription. Thus the subscriber gets, something, yes, much, for nothing, but still the publisher willingly bears his loss, as he needs readers to give value to the advertising columns. In other words, circulation counts, and it counts for a very great deal from the publisher's standpoint, even though the advertisers should always reserve the right, and persist in it, to criticise the quantity in a demand for quality. Quantity without quality will bring disappointment. That, however, is another story.

The Careless Reader the Greatest Loser.

A subscriber who receives his paper, carelessly glances over it as he applies thumb pressure to shoot the leaves along, stopping only to casually and quickly read a paragraph, a note here and there, does not do himself or the publisher justice. He will be the greatest loser. The publisher will get just as much money from him, but he will fail in acquiring the exceedingly valuable fund of information the publication brings to him. And the more of this information he gleans the higher and better will be his appreciation of the publication. The faithful, energetic editors work hard to have the pages up to date in the data they carry. Type forms and illustrations are carefully studied in order that the appearance may be of the best, each thoughtful attention in this direction being intended to hold interest on the part of the reader. Many fields have been searched for the actual news and scientific information placed before the subscriber by the editors, who are very materially helped on the larger number of pages by the men who write and plan the advertisements.

The subscriber who looks upon the advertising pages of trade publications of to-day as tales of purchased space makes a very serious mistake. These advertisements are developed by able minds in every part of the country, each one of which seeks to educate the subscribers of the trade publication to the latest and best practice in a particular line. Publishers of trade papers have high morals; they scan every bit of copy that comes to their office, determined that their readers shall be protected from advertisements that make false claims. Occasionally a fake assertion that has a

new feature may creep in unknowingly, but as soon as the deceit is made apparent the columns of honest papers are forever closed to that business. And the average reader does not know how many advertising men there are who are cautioned not to call on this or that concern whose business by the publisher is deemed undesirable.

Handling Trade Papers Methodically.

Let me advocate a higher appreciation of the trade paper. Let me tell of one progressive company and its realization of the importance of thoroughly reading what the editors and others have to say in these factors of this modern industrial growth. The company to which I refer receives a very large number of trade and technical papers, but it makes easy the reading, handling and disposition of them. They are all first handled and opened by the one who distributes them to the department or employee most vitally interested in the various publications. For instance, an engineering publication first goes to the company engineer; a paper that has to do with power is sent to the mechanical department, as are also machinery papers; the electrical papers go to the electrical engineers, except papers that carry patent references, which first go to one who scans the patent report to see if any of the late issues have to do with fields in which the company operates, and if so, this department immediately sends for these patents of interest; papers that are associated with the chemical, electrochemical, electrometallurgical field all have their readers; automobile publications go to various departments, as do those devoted to military affairs, while the same may be said of marine, paint, power boat and similar fields; *The Iron Age* and other publications go regularly to individual readers. It is well understood among the employees of this company that they are, in a certain sense, responsible for reading these publications and getting from them everything of present or future interest to the company's affairs. Articles of interest are abstracted, and cards in the following form are made out for filing in a well planned system:

Title
Publication
Date
Author
Remarks
File under.....

All such cards are sent to the stenographic department and filed. Subjects having any relation to the field in which the company sells its products, or to the use and application of its products, are most carefully covered, so that, for instance, should the company at any time desire information on any of the many subjects it would only be necessary to call for the cards on file and direct that the publications containing the articles or references listed be brought up from the basement for review. To facilitate this review, it may be stated that all the trade papers received in the English language as well as foreign languages are most carefully preserved by means of a filing system, to which a goodly space has been given in a spacious basement, the plan being to bundle each year of the various publications by themselves. Clipping of the publications is prohibited.

In order to have the publications distributed and pass from department to department, so that all may see them, discover new features or absorb the information of articles marked, each publication is first stamped with the initials of the several readers who

are to see them in the course of their transit through office and works, the stamp used being something like this:

K. W. S.
D. S. A.
P. L. M.
B. G. R.
C. D. E.
T. R. E.
J. U. D.

A list of publications received and the readers assigned is in possession of each department, so that the course to be followed in sending a publication forward is so well known that it soon becomes a matter of form, each reader checking on the dotted line following his initials. The sales department, the financial department, the chemists, the superintendent, the engineer, the electrical engineers, the executive department and others are all alert to new things, and it may be guessed that a fund of information is gathered. Then, too, it makes possible the reading up on things in which to-day a company seemingly has little interest, but which is conceived to possess future features of possible value.

Every Item Preserved.

By this system, every item printed in the publications read is preserved, so that when the day comes when the concern wants information on the subject it will only have to turn to its filing system to review all that has been printed. This is a factor of wonderful value, it is believed, as it makes possible a general oversight aided by the many bright minds that write for the publications. It will thus give life to the writings of many editors long after they may be dead.

If one will only consider the immense amount of capital and human energy now devoted to preparing and printing the trade papers which serve as guides in their respective fields, I am very confident there will be a general increase in appreciation of the service performed. It is but fair to admit that the principal trade papers are always ahead of their readers in information. They must be so, for they are teachers; they tell us of the newest and best things, of the latest practice in many lines, and it is indeed a dull reader who cannot profit by perusal of them. If subscribers will thus cherish their trade papers I am sure there will be an awakening as to their value and of the good they do, of their great general worth and assistance. When subscribers thus esteem their technical and trade papers, they will deserve to have their names enrolled on that monument of quality instead of being considered quantity, which, as I have said, is another story.

Electric Mine Hoists.

The March meeting of the American Institute of Electrical Engineers, held in New York, was devoted to the general subject of electrically operated mine hoists.

The first paper, presented by D. B. Rushmore and K. A. Pauly, discussed the characteristics of the direct current shunt wound motor and the induction motor, with special reference to their adaptability for hoisting service. Although a number of systems have been proposed to meet special conditions, there are in reality but four. The simplest consists of a polyphase induction motor connected either directly or by gearing to the hoist drum, while the next simplest is a combination of a shunt wound direct current motor to drive the hoist and an induction or synchronous motor generator set to supply energy from the alternating current supply system to the motor. The other two systems both make use of a flywheel to store and return energy for short intervals. The third system is similar to the second, except for the addition of a flywheel to the induction motor generator set and an automatic regulator for varying its speed. The first and fourth ar-

rangements are about the same, except that a converter equalizer is added. This equalizer consists of a rotary converter connected between the alternating current supply mains and the direct current motor driving the flywheel. The efficiency of the last arrangement is slightly lower and the weight of the flywheel greater as a general thing than the third method, but it possesses the advantage that the operation of the hoist motor is not dependent upon the converter equalizer.

The next paper, by Wilfred Sykes, contained a detailed discussion of the force, speed, power and energy relations in the various types of hoists and an application of these relations to electric hoisting equipments where flywheels are used to store energy. The principal advantages of this type of hoist are complete control when running, precise manipulation, a return of energy to the supply system and the application of positive automatic speed reducing devices to prevent overwinding.

R. R. Seeber outlined tests made on a hoist of the flywheel motor generator type, where two generators are driven by a single induction motor through flexible couplings. These generators supply energy to motors operating hoists at different shafts. The tests showed a consumption of 1.79 kw.-hrs. per ton of rock hoisted 600 ft. up a 70-degree incline. The coal used was about 4 lb. per kw.-hr., which gives a ratio to coal of 279 to 1. Tests made upon steam hoists under similar conditions gave ratios varying from 100 to 1 to 200 to 1.

The Cleveland Soda and Potash Kettle.

The Cleveland Machine Specialty Company, Cleveland, Ohio, has recently placed on the market a new



A 30-Gal. Soda and Potash Kettle, Made by the Cleveland Machine Specialty Company, Cleveland, Ohio.

soda and potash kettle, which is shown in the accompanying illustration. The burners are arranged in a fixed position and either artificial or natural gas can be used. The bottom of the pot is covered with little projections about $\frac{1}{2}$ in. deep. These break up the flame, and it is claimed that kettles so designed take up the heat about 50 per cent. faster than the smooth bottom kettles and effect a great economy in gas necessary to keep the solution boiling.

These kettles are made in two sizes, of 10 and 30 gal. capacity, respectively. Because of the convenience of connecting them to the gas supply and their economy of operation they are said to be meeting with considerable favor among manufacturers. Dipping baskets of various sizes are furnished for washing machine parts.

The Radial Power Hammer.

A Universal Forging Machine.

What the radial drill is to the ordinary upright drill the radial power hammer is to the ordinary power hammer. The radial arrangement in this case, however, is applied for a different motive. Instead of being for the purpose of adjusting the working tool to the work, its function is to bring the working tool over a variety of working bases, and so great is the range of work possible on the hammer that it has been very aptly called a universal forging machine. The radial power hammer enables a blacksmith, without assistance, to do all operations ordinarily usually done with the aid of a helper, and it is claimed to do them better, quicker and cheaper. The hammer is the invention of James A. Brown and Fred E. Sutherland, and is built by the Radial Power Hammer Company, Los Angeles, Cal.

Fig. 1 shows a front and right side view of a 75-lb. radial power hammer machine, and Fig. 2 a rear and left side view. The main feature of this hammer is the radially swinging bracket arm formed with guides, in which the hammer head is mounted. This arm can be swung to a position either over a vise attachment at the left of the machine, shown in Fig. 2, or an anvil block at the front, shown in Fig. 1, or a swage block or a bending device, also shown in Fig. 1. The swage block is circular and rotatable on a heavy stub shaft, and grooves of various forms and sizes are formed in its periphery; a pocket for inserting special swages is also provided.

The arm swings on bearings formed on a vertically adjustable bracket, slidable in guides on the frame-standard. Straight and crossed belts lead from the main driving shaft and a clutch engages either driven pulley to a short horizontal shaft, which is in turn bevel-gear connected to a vertical screw-shaft, used to raise or lower the bracket and

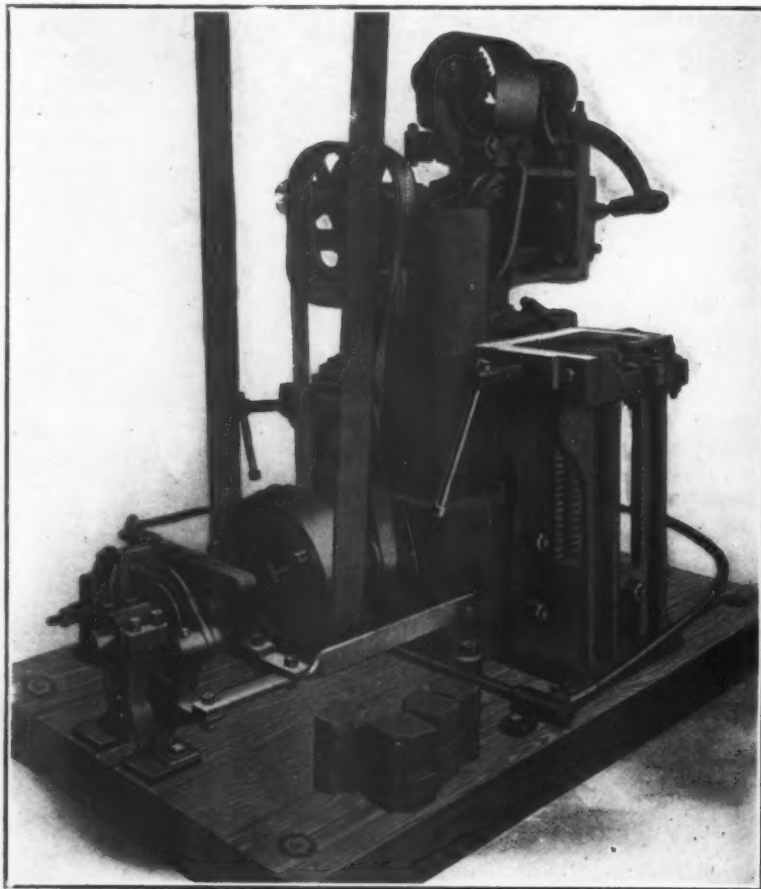


Fig. 2.—Rear View of the Hammer, Showing the Drive and the Vise.

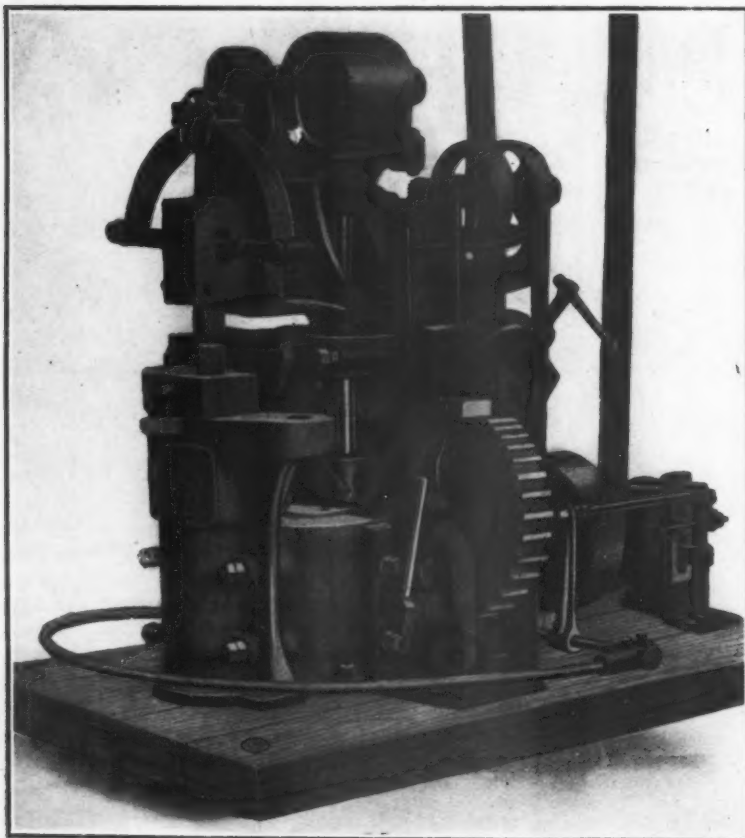


Fig. 1.—Right Side View of a 75-lb. Radial Power Hammer, Showing the Circular Swage Block and Bending Clamp.

head for work of different heights.

The head is spring connected to an adjustable disk-crank driven by bevel gears from a vertical shaft mounted centrally of the bearings in the bracket. A feather connection between this shaft and its driving means permits vertical adjustment. The special connection between the head and crank enables the head to be worked within a 30-in. circle, so that it can be used in welding up small tires or similar work.

A combined friction clutch and brake is mounted on the main drive shaft, and is arranged so that the release of the clutch brings the brake into action, and *vice versa*. Thus the most delicate adjustment of the speed of the head is possible, and, because of its spring connection with the crank, of the force of the blow struck. The clutch and brake mechanism is controlled by a foot lever extending around the front and sides of the machine, so that the blacksmith has both hands free to handle the work.

The machine is rugged and substantial, designed for hard work and rough usage, and the various adjustments are simple and easily made. The head weighs 75 lb. and has a vertical adjustment of 15 in. The ma-

chine requires a floor space of 4 ft. x 6 ft. 6 in., and can be operated by a 2-hp. motor.

The New Cisco 14-in. Lathe.

The machinery and equipment department of the Cincinnati Iron & Steel Company, Cincinnati, Ohio, has recently placed on the market the 14-in. lathe shown in the accompanying illustration. This tool is known as the new Cisco 14-in. quick change gear engine lathe and in its general construction does not differ very much from the others of this line. The special features of this particular lathe are the simplicity of the quick change gear device and the exceptionally powerful apron drive. Figs. 1 and 2 show two views of the lathe, and Fig. 3 the mechanism of the apron.

Two levers are all that are required to operate the

pockets are provided. The bed and legs are massive and heavy. A taper attachment need not be purchased with the lathe unless there is an immediate demand for one, as the carriage is drilled in a jig, so that an attachment can be added when required. Only two wrenches are necessary to make any adjustment on the entire lathe, and every part of the lathe can be duplicated at any time.

The National Lead Company's Report.

The National Lead Company, in its report for the fiscal year ending December 31, 1909, shows a surplus of \$4,713,373 after dividend payments of \$1,705,732 on its preferred stock and \$1,032,770 on its common stock. The net earnings of the company for 1909 were \$2,993,420, an increase on the preceding year of \$90,667. L.

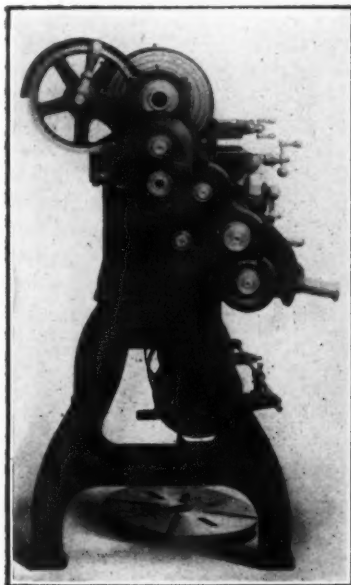


Fig. 1.—Head End.

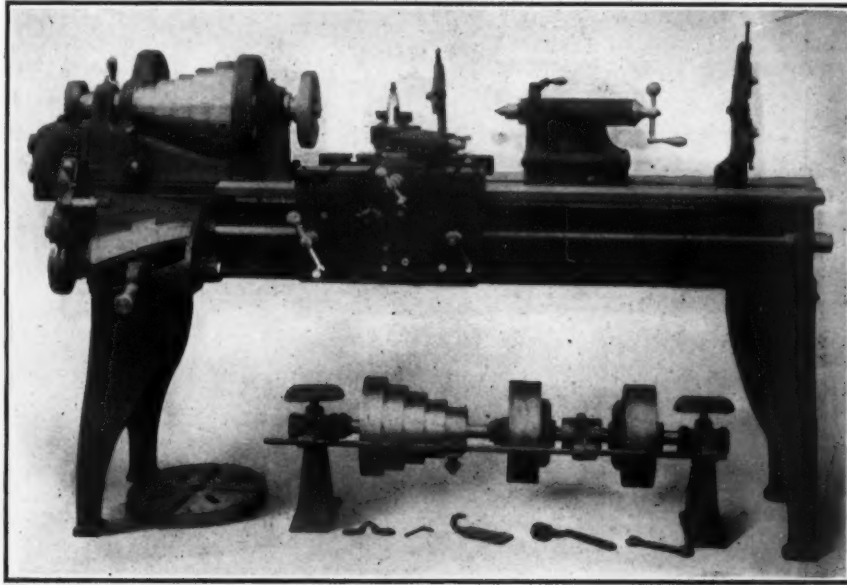


Fig. 2.—Front View with Countershaft.

The New Cisco 14-In. Lathe Built by the Cincinnati Iron & Steel Company, Cincinnati, Ohio.

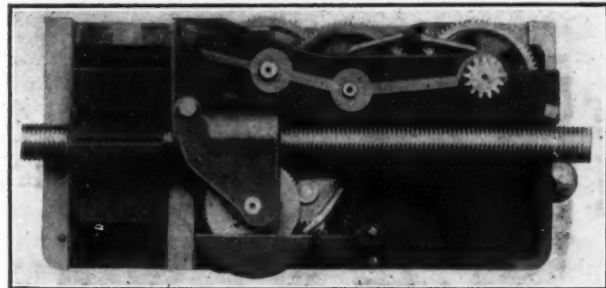


Fig. 3.—Detail of the Apron Viewed from the Rear.

quick change gears, which will cut from 3 to 32 threads per inch. Thirty-three changes of feed, ranging from 18 to 192 threads per inch, are provided. All the gears are covered, and to make it impossible to engage two gears at the same time a positive locking device is provided.

The construction of the apron is heavy and massive. A worm drive is employed, and this is equipped with a non-interfering device which, it is claimed, makes it impossible to engage the feed and the lead screw simultaneously. The apron is fed in either direction regardless of the direction of the feed screw. All the bearings are provided with double supports.

Although nominally a 14-in. lathe, the actual swing is 15 $\frac{3}{8}$ in., and the hole in the spindle is large enough to pass 1 5-16-in. stock. The countershaft is equipped with a Nugent friction clutch and either a four or five step cone driving pulley, as may be desired. Extra large phosphor-bronze bearings are employed throughout and ample facilities for lubrication and large oil

A. Cole, president, in his accompanying remarks to the stockholders, says:

"The volume of business shows a notable increase over that of the preceding year and exceeds in tonnage anything in the history of the company. In the last half of the year all raw material entering into finished products advanced in value and measurable increases were made in the price of manufactured goods. In the last annual report reference was made to plans then prepared for the manufacture of ammunition. During the year under review we acquired an important interest in a well established business making a specialty of such manufacture, and its field of operation will be broadened.

"The business of the current year exceeds that of last, and, while it is yet too early to make predictions, the general prosperity of the country justifies a hopeful outlook. Active competition continues, but it is wholesome rather than destructive."

H. A. May has purchased the foundry formerly operated by Theodore B. Rohrman at Thirtieth and Ludlow streets, Philadelphia, Pa., and is operating it under the name of the Empire Foundry Company, continuing the manufacture of iron and brass castings for machinists, railroads, car builders, chemical works, &c.

The Krupp Foundry Company, Ltd., Lansdale, Pa., manufacturer of soil pipes, fittings and general plumbing supplies, has been incorporated with a capital stock of \$100,000, the title of the company having been changed April 1 to the Krupp Foundry Company. No improvements to the plant are contemplated at the present time.

Salvage by Means of Lifting Magnets

An Important Development in Mississippi River Traffic in Steel Products.

The interesting fact was noticed in *The Iron Age* of March 17 that a large lifting magnet has been used recently at New Orleans to raise a sunken cargo of steel products. A view of the operation is given in the accompanying illustration. On February 9 a model barge which had been towed from Pittsburgh to New Orleans laden with 1500 tons of steel products, chiefly wire nails in kegs, and in addition hoops and barbed wire, broke loose from the tug which was landing her at New Orleans, struck the wharf and sank within



The Use of Lifting Magnets to Raise Sunken Wire Products at New Orleans, La.

30 ft. of the docks in 55 ft. of water. It was ascertained by divers that the barge at once began slipping into deeper water, as had happened before when similar accidents occurred. The Mississippi at New Orleans reaches in some places a depth of 200 ft. and has dangerous eddies and "boils." Thus a sunken barge becomes a serious matter. The great volume of water passing down the river scours out the channel, and as the banks are sheer on both sides the eddies and "boils" tend to carry a sunken barge into deep water. Divers, owing to the action on the heart of such air pressures as are required at the greater depths to counteract the pressure of the water, cannot stay down long in water deeper than 75 ft. Lifting magnets had been suggested, and while at first there was skepticism as to their availability, a plan was finally developed by the Carnegie Steel Company and was first put into execution in raising the cargo shown in the illustration. The magnet was manufactured by the Cutler-Hammer Mfg. Company, Milwaukee, Wis., and an electrician from the Homestead Steel Works was sent to New Orleans to make the installation. The work of recovering the cargo was carried on by the American Steel & Wire Company.

The barge, which was 200 ft. long, had broken in

two in sinking. One portion was found in 75 ft. of water, where the current was not strong, but the remainder had been carried 150 ft. from shore, about 40 ft. further down stream, and was in 100 ft. of water, with a strong current. The recovery of the cargo from the portion of the barge nearest the shore was not difficult, but the swift current further out gave the divers considerable trouble. The largest load brought up at one time with the magnet, which is 43 in. in diameter, was five 100-lb. kegs of nails, a bundle of hoops weighing 79 lb. and a bundle of fence wire weighing 155 lb. When working in a part of the barge well stocked with cargo the magnet averaged about four kegs of nails at a haul. It is stated that in one case a bunch of nails was brought up the exact shape of a keg, but with the keg missing, it having been broken off. In dropping the load, in view of the tendency of the steel to stick even after the current has been turned off, there is a reversal of current in the magnet. The recovered products were naturally rusty and the nails were cleaned in a tumbling barrel containing a quantity of sawdust and soda.

The magnet employed at New Orleans, as the illustration shows, bears a general resemblance to those used in steel work yards for handling pig iron, billets and scrap. It is 43 in. in diameter and 10 in. high and weighs 3200 lb. A special liquid insulator poured hot into and around the coils was used in the construction of this magnet as a protection against moisture, which by shortening the coils would have made the magnet weakly effective under water. On cooling this insulating material hardened and became waterproof. The supply wires, led through a water tight bushing, were heavily rubber coated, and as an outside envelope a rubber garden hose gave further protection.

The conditions and requirements of Mississippi River traffic have been studied with much care by Pittsburgh steel companies in the past year or two. The plans for the use of all steel barges in this trade were noted in these columns some time ago. For all steel cargoes, instead of the mixed cargoes which have been more common in Mississippi River traffic, it has been considered that the all steel barge is better suited than the wooden barge. In case of breaking loose from the towboat and striking a sand bar or bridge, as has happened with wooden barges, the all steel barge is naturally much less liable to be stove in and sunk. Its longer life is also an important factor compensating for increased cost. Furthermore, the possibilities of increased salvage now opened up by the use of the lifting magnet have given the recent performance at the Lafayette street docks at New Orleans special interest and significance in the effort to reduce to a minimum the losses incident to river transportation.

The Pugh Glasses for Steel Melters.—Announcement is made of the connection of Mrs. Pugh, who has become well known as the maker of colored glasses for melters at open hearth furnaces, with the F. W. King Optical Company, Cleveland, Ohio. Glasses of various forms and of the shade secured by the Pugh process are now furnished by the above company, which also manufactures glasses adapted to the requirements of workers employed at heating furnaces, at electric welding and in other positions exposing the eyes to great heat or to blinding light.

A movement is under way by the citizens of Wheeling, W. Va., to raise money to erect a new sheet and tin mill plant in that city. The matter has been taken up actively by the Industry Committee of the Wheeling Board of Trade, which has secured a site at Glenova, near Wheeling, on which it is proposed to erect an eight-mill sheet and galvanizing plant and probably a tin mill as well. Unsuccessful efforts were made to purchase the La Belle Works of the American Sheet &

Tin Plate Company, which has been shut down for some months on account of labor troubles.

A New Queen City Shaper.

Improvements have recently been made in the 24-in. back-geared crank shaper, Fig. 1, built by the Queen City Machine Tool Company, Cincinnati, Ohio. The specially claimed advantages are the ease and facility

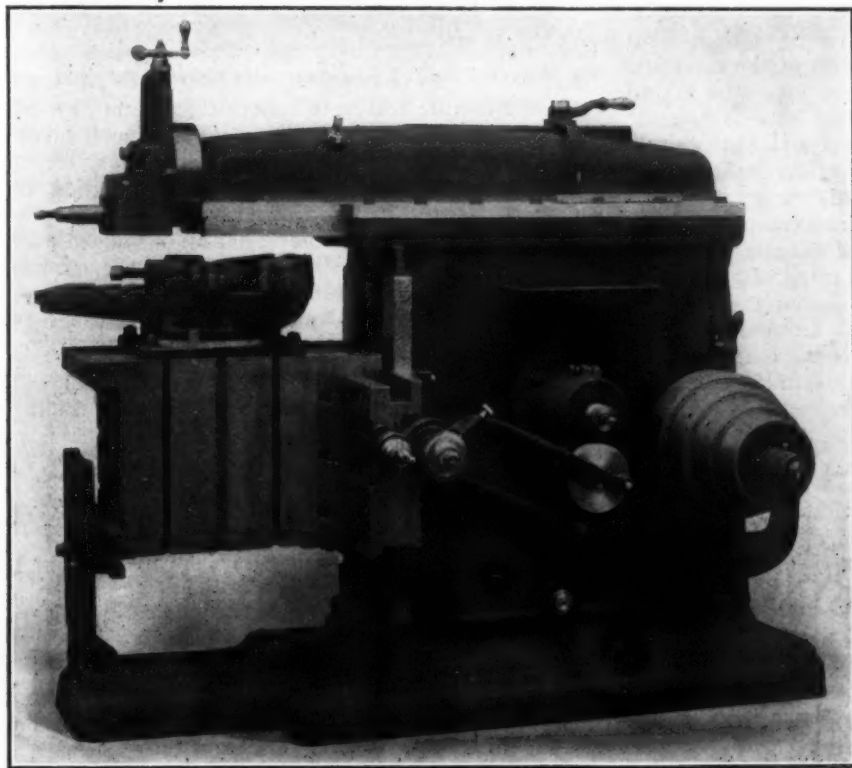


Fig. 1.—The Improved 24-In. Back-Geared Crank Shaper Built by the Queen City Machine Tool Company, Cincinnati, Ohio.

with which changes of feed are accomplished, with the least loss of time in operation and assurance of perfect safety at all times to the operator. The automatic feed, details of which are given in Fig. 2, is susceptible of 16 changes: 1-64 to $\frac{1}{4}$ in. on the 24-in. machine, from zero to full feed or reverse, or to and from any number of notches, either direction, all capable of being made instantly while the machine is running. This is accomplished by the aid of the cam at the end of the cross traverse screw, and to keep the feed on the return stroke the plunger is lifted out with a lever on the feed rod, which permits of its automatic movement to the opposite side of the plate, and its dropping into the hole shown. The feed and distance rods act automatically and in fixed relation, regardless of the height of the rail.

Through the action of the friction device the feed is practically fool proof. It transmits ample power to feed at all times, but not enough to break any of the parts if the operator should attempt to feed on the

cut or allow the saddle nut to strike against the rail at either end. Provision is also made for an automatic stop and for a finer feed if desired. Among other points which are considered as of special importance the characteristic of rigidity is strongly emphasized. In this connection attention is directed to the table support, which has a full 15-in. vertical adjustment, and is self-aligning and self-adjusting. In changing the height of the table for a new operation there is a saving of a number of movements that ordinarily consume considerable time. When making changes the only operation necessary is the loosening of the nut on the stud at the top; and as the cap screws fix it firmly to a sliding rail, it cannot fall away from the column.

The manufacturer is arranging to equip its 16 and 20-in. machines with the features described.

The Allis-Chalmers Company, Milwaukee, Wis., reports that its gas engine business continues to increase and at present the full capacity of the gas engine shop is required for gas engines alone. Some of the recent sales are as follows: One 18 x 24 in. engine and generator to the American Car & Foundry Company for its plant at Huntington, W. Va.; three 24 x 36 in. engines and generators to the Alpha Portland Cement Company for its new plant at Alsens, N. Y., and three 18 x 24 in. engines and generators to the Guanica Centrale Company for a sugar mill in Porto Rico. There are many other propositions under consideration, and it is apparent that the gas engine is now fully as acceptable for power purposes as any other type of prime mover.

The Colonial Steel Company, Pittsburgh, Pa., man-

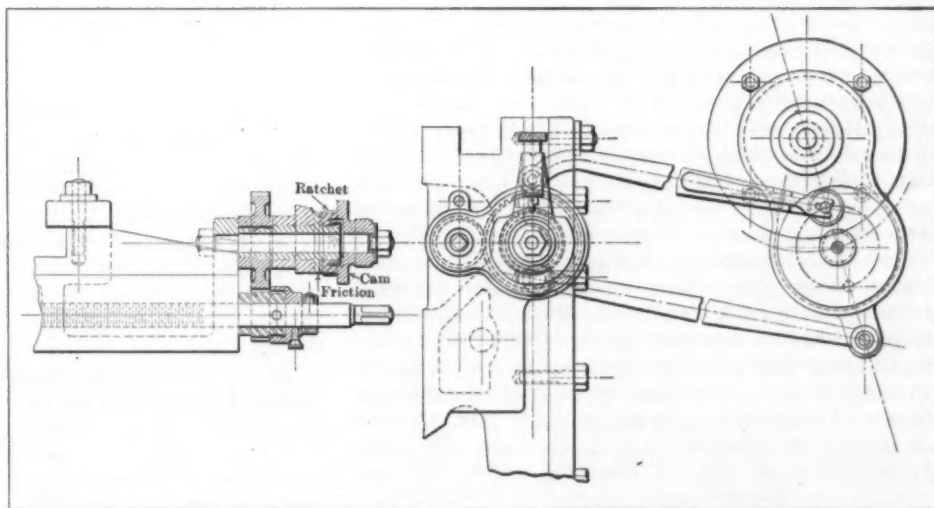


Fig. 2.—Details of the New Feed on the Queen City Shaper.

ufacturer of high speed and carbon tool steels, also nickel and high grade open hearth steels, has opened an office in the Ford Building, Detroit, Mich., in charge of Frank Illenberger.

The Effect of Superheated Steam on Cast Iron and Steel.

Precautions Necessary in Installations—Characteristics of the Metals to Be Considered.

BY ALBERT A. CARY, NEW YORK.

The discussion in the technical and trade papers during the past few years concerning the destructive effects of superheated steam on valves, fittings and even engine cylinders has caused many to reject its use where very great benefits would follow its adoption, and others to accept it with fear when it became indispensable. This situation has been taken advantage of by some who either manufacture inferior steam appliances, which cannot meet the severer requirements found in superheated steam installations, or who have higher priced products to sell than is found in ordinary competition. Further antagonism exists among some pipe fitters, who know that superheated steam installations call for superior fittings, pipe and workmanship, and that caulked joints and other cobbled up imperfections, commonly resorted to in ordinary steam lines, will only lead to trouble.

Necessity of Good Design.

After investigating a number of plants having trouble with the use of superheated steam the writer concludes that many, if not most, of their troubles have been due to bad design in the piping arrangements. Far greater care and better judgment is called for than with saturated steam, as the strain due to expansion and contraction is greatly increased. Every joint should be carefully considered to see that proper arrangements are made for a minimum stress being thrown upon the flanges and threads.

Several special forms of flanges, on pipe ends, which avoid the screw connection are now used to excellent advantage, with high superheat. Continued flexing on one side of the flanges of fittings, due to the cooling and high degree of heating of the pipe system (as steam is turned on and shut off) will cause ruptures, and be apt to change the internal structure of the metal itself.

As higher velocities are permissible in pipes carrying superheated steam than in those carrying saturated steam, somewhat smaller piping can be used, not only decreasing the cost, but also increasing the flexibility of the pipe line.

Care must be taken in placing flexible pipe bends—bent to large radii—most effectively and properly anchoring the pipe on either side of these bends. Supervision must be exercised in seeing that the pipe fitters make up their pipe lines so as to require no severe springing of the pipe to make the flanges of the joints register. Undoubtedly, neglect in these particulars of pipe design and fitting are responsible for a very large percentage of the failures found in the fittings and joints in superheated steam plants.

Superheated Steam Below and Above 500 Degrees F.

Steam with a total temperature below 500 degrees will be found better applicable to old plants (in which it may be newly introduced) and in many new plants. With such steam may be used ordinary high grade heavy fittings (with some modifications), such as are used in saturated steam work.

The high temperature superheated steam is more especially adapted to installations where high pressure steam is required and for steam turbines.

The Effect of Heat Upon Cast Iron Valves and Fittings.

There is little reason to believe that steam has any material chemical effect upon metal parts, and, therefore, physical effects must be considered to arrive at any desirable information concerning the action of superheated steam upon cast iron parts.

Chemical analysis of the metal is undoubtedly of value to show its quality, but probably the chemist can help but little beyond this point.

Characteristics in the Cooling of Water

An explanation of the characteristics of a certain interesting cooling curve in which water is used will help to make clear the characteristics of the cooling curve obtained from the metals under discussion. Fig. 1 shows a cooling curve, beginning with water, in the form of steam, at 300 degrees. In 5 min. this steam drops to 212 degrees. Then comes the first point

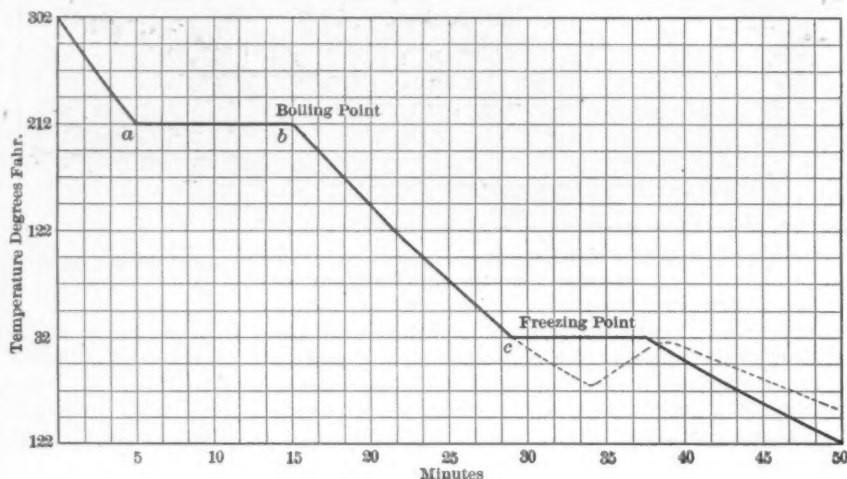


Fig. 1.—Cooling Curve of Water.

of arrest at *a*, where the latent heat of evaporation must be given up before the steam can pass into a liquid. This critical condition is indicated by the horizontal line *a-b*, which shows that there is no loss in temperature for 10 min., although the steam is continuously cooled. Finally, at *b*, the steam is wholly converted into water, and then, during the next 15 min., the temperature drops from boiling to freezing, at 32 degrees. Here is a second point of arrest, where still more latent heat must escape (requiring about 7 min. in time) before the water can pass into its solid state of ice. The ice then falls in temperature, uniformly.

In its three states, gaseous, liquid and solid, the chemical characteristics of water do not change, but its physical characteristics are decidedly different.

Before continuing, attention is called to a dotted line shown at *c*, the second point of arrest. It is generally known that water may be cooled some few degrees below its critical freezing temperature if it is kept in a perfectly quiescent state, and when the continued rate of cooling may proceed without interruption. It is there said to be in a state of superfusion or sufusion, which is a condition of unstable equilibrium; it requires but a slight disturbance, such as dropping into it a small piece of ice, to cause it to solidify very

quickly with an evolution of heat, such as is indicated by the dotted line curve shown.

Characteristics in the Cooling of Iron.

With these familiar facts in mind, turn now to Fig. 2, showing the cooling curve of chemically pure iron from Herr Goerings' work on metallurgy. The iron at 2912 degrees is in its liquid form, cooling down to a temperature of 2741 degrees, where its first point of arrest occurs and solidification begins. As before, where the liquid passes to its solid state, this critical temperature is maintained (for about five minutes), and then a peculiar form of solid iron is formed which has been designated "gamma iron." Its cooling continues for some 37 minutes, and then another point of arrest is found at 1616 degrees. The physical character of the metal changes materially at this point into what is called "beta iron," which continues its cooling down to 1436 degrees, when another point of arrest indicates a further change in the physical quality of the metal, which now becomes what is known as "alpha iron," which is a stable physical form of the metal below its third point of temperature arrest.

This chart shows that iron may undergo four changes in its different states of aggregation, under the influence of heat, and the physical characteristics of the metal alter in each case.

Although somewhat foreign to this discussion, it is interesting to note that "alpha iron" is readily attracted by a magnet, while "beta iron" and "gamma iron" are not.

The heating curves show the same points of arrest except that they are at slightly higher temperatures than in the cooling curve, which seems to be due to a kind of molecular inertia or lag.

Now, consider the cooling curve shown in Fig. 3 (also from Goerings' work), which shows the occurrences noted during the cooling of gray pig iron. Here the first point of arrest preceding solidification occurs at 2048 degrees, while the lower point of arrest occurs at 1296 degrees, which temperatures are lower than the corresponding ones noted during the cooling

condition of "beta iron" into the "alpha iron," which, under normal conditions, is soft. This produces an iron with unstable physical qualities, and the question has been asked whether there is not some method to prevent such changes from taking place, and J. W. Mellor, in discussing this subject, states: "It is supposed that the presence of many foreign substances, like carbon, nickel and manganese, augment the passive resistance so as to render the hard 'gamma iron' more stable and

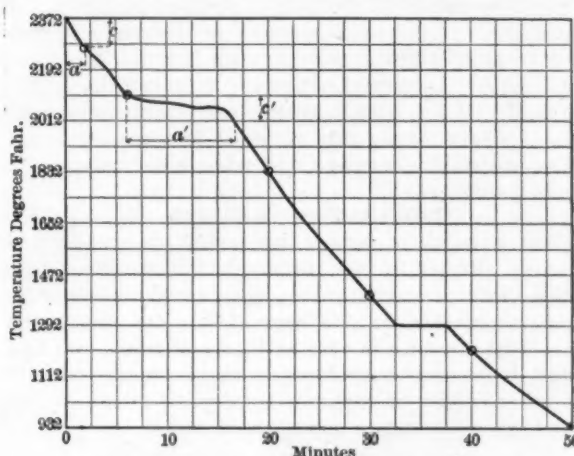


Fig. 3.—Cooling Curve of Gray Pig Iron.

permanent at low temperatures." On the other hand, the presence of chromium, tungsten, aluminum, silicon, phosphorus, arsenic and sulphur facilitate the passage of hard "beta iron" into the soft "alpha iron."

Fig. 3 does not furnish the minimum temperature obtainable in the lower point of arrest with cast irons, as the writer has seen this happen at a temperature of over 100 degrees below this temperature.

Some such heat investigations with iron, the writer believes, will have to be continued to reach a satisfactory explanation for some of the troubles met with in metals used in superheated steam work. The thermal investigation of the properties of metals is but in its infancy, and new facts of great value are constantly being brought out as this work progresses.

Loss of Strength at High Temperatures.

Comparatively few tests are available in the investigation of cast iron under temperatures below 1500 degrees, but certain tests were made at the Watertown Arsenal, where samples of cast gun iron were tested at various temperatures, under tensile strain, from normal temperatures up to 1500 degrees F. The average of these tests showed the normal strength of the iron to be about 30,000 lb. This strength was maintained until a temperature of 900 degrees F. was reached, and from that it gradually dropped, and at 1500 degrees it was only 20,000 lb., while at 1500 degrees the tensile strength dropped to 10,000 lb.

Without doubt a change in molecular structure occurred in this iron at a temperature of about 900 degrees F., and probably with other grades of cast iron such a change would occur at a still lower temperature. This will doubtless account for many of the troubles reported as occurring in the cast iron parts, in pipe lines, using superheated steam.

Steel Test.

Temperature investigations of the characteristics of different steels at various temperatures have received more attention than any other branch of this subject and afford ample evidence that the effect of temperature upon this metal is very pronounced. Tests for tensile strength have shown that mild steel attains its greatest strength at about 500 degrees, and with a further increase of temperature its strength rapidly declines. The elastic limit of this steel also diminishes with increased temperature.

The cooling curves for certain steels show points

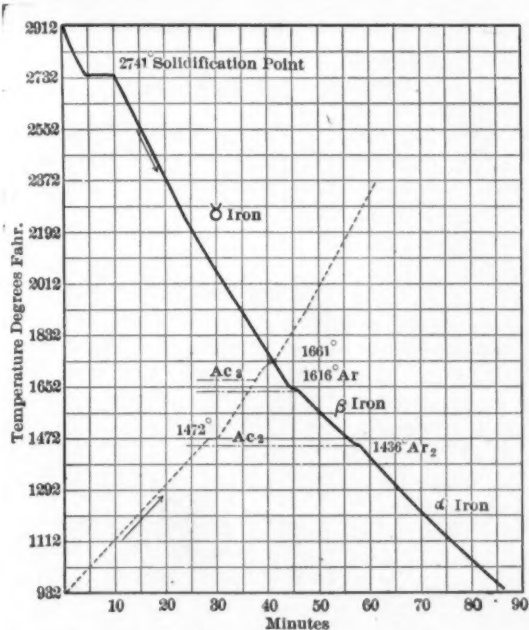


Fig. 2.—Cooling Curve of Pure Iron.

of pure iron. From these two curves it appears that when foreign impurities accompany iron, important physical changes occur.

In the water cooling curve it was shown that under certain conditions, a lowering of temperature below the critical one was possible without changing the physical condition of the material. It is possible that this may be done in the case of iron; very rapid cooling carrying the "gamma iron," which is hard, past the

of arrest in the rate of cooling at about 1337 degrees F. and between 1100 and 1200 degrees. The latter temperature is known as that of recalescence and is most important in the manipulation of steel, such as hot rolling, hammering or forging.

The effects of lower temperatures on steel are well known through the process of drawing its temper after hardening, and every steel worker knows the danger of working steel at the so-called "blue heat," which is made apparent on the bright, polished metal by the appearance of the oxide coating on its surface, running from a bright straw color up into the blue, and produced by temperatures ranging from 430 up to 600 degree F. When steel is worked or placed under continuous strain within this range of temperature, especially near the higher degree, it will remain very brittle after cooling.

Effect of Heat on Copper.

The strength of copper and many of its alloys is seriously affected by heat, although, in the case of copper, its loss of strength does not exceed 16 per cent. at a temperature of 500 degrees F.; but above 500 degrees its strength is very seriously affected, and this should be remembered in the use of copper gaskets and other copper or copper alloyed parts in connection with high temperature superheated steam.

Effects of Different Rates of Expansion.

Another matter is important to keep in mind in superheated steam work, where the expansion due to heat is very considerable. The coefficients of expansion of different metals brought together in such steam lines must be carefully considered. To illustrate: The linear coefficient of expansion of cast iron is 0.00000556, while that of brass is 0.00000957.

The effect of this difference in expansion was forcibly impressed on the writer when he examined a valve with a cast iron body and a brass (or bronze) seat, used in a superheated steam line. The seat had originally been forced into its recessed seat under very great pressure and fitted it very securely. After a few months' use it was possible to twist it easily around in its seat with the fingers. As the expansion of this seat was much greater than the valve body, the metal had actually been condensed, or compressed into a smaller volume, so that when cooled the condensed metal seat occupied so much less space in its seating that it naturally became a loose fit.

With this great difference in the expansion of copper as compared with cast iron, or even with steel, at high temperatures, who can wonder at the destruction of the thin copper gaskets when firmly held between such flanges. The reason for the greater success attending the use of soft steel gaskets in high temperature pipe lines becomes quite apparent.

Microscopic Examinations.

The question naturally occurs: "How are the effects of temperature upon metal parts in superheated steam lines which have failed to be recognized?" Fortunately, each critical point in metals leaves its mark behind in the crystalline structure of the material, so that it is possible to recognize its condition by microscopic examination, and from such observations the cause of trouble may be traced.

This does not mean the mere breaking of the metal part and examining the fracture with the naked eye or even with a strong magnifying glass, but the careful polishing of a sample and etching its smooth surface, and then examining this with a microscope, magnifying the specimen to from 100 to 500 diameters (and occasionally more) while it is illuminated by a direct or oblique light, reflected from special mirrors. The crystalline condition thus revealed will yield more information than any other means. Not only can the effect of temperature be traced in this way, but the influence of stress and strain can also be recognized.

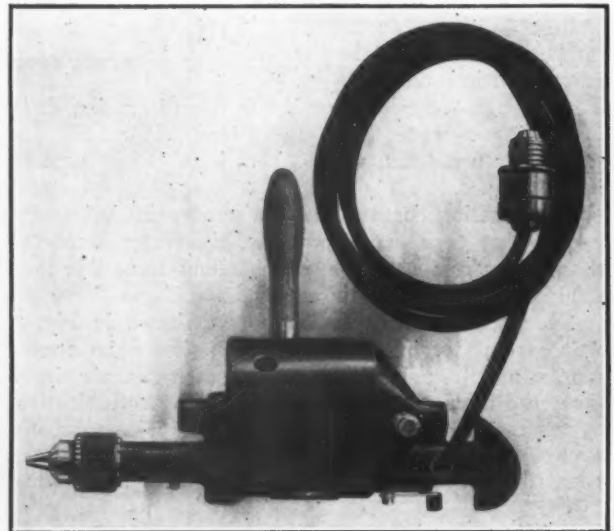
In many superheated steam pipe lines at times few fittings have been found in bad condition and this led to the unjust condemnation of the whole use of su-

perheated steam. If it is such a destructor of metal parts, why were not all of the valves and fittings along the lines equally affected? The general design of pipe lines should be considered and greater allowance made for expansion and contraction than where saturated steam is used.

As for engine cylinders, it must be remembered that there is less lubricating distribution with superheated steam than with saturated steam, and nothing but the best quality of oil must be used and one having a flash point considerably above the temperature of the steam at the throttle valve; means for the continuous delivery of this oil to the cylinder must also be provided. With such care the danger of using superheated steam with reciprocating engines is reduced to practically the same status as that attending the use of saturated steam.

The Lamb Portable Electric Drill.

No fan is required to keep the motor cool in the electric drill made by the Lamb Electric Company,



A New Portable Electric Drill Made by the Lamb Electric Company, Grand Rapids, Mich.

Grand Rapids, Mich. The motor is claimed to be sufficiently thoroughly ventilated without this recourse because of refinements in its design. An advantage is that there is done away with the drawing into the working parts of dust and chips. Other features of the drill are ease of inspection and taking apart; the loosening of two nuts permits one to be taken entirely apart in a few moments' time, and the commutator and brushes can be inspected through a small window. The drills have a ball thrust bearing and work equally well in any position. The alternating current pattern, which is generally similar to the direct current drill described below, and illustrated herewith, differs only in that it has no commutator and is a little larger and slightly heavier.

The illustration shows a drill capable of drilling $\frac{3}{8}$ -in. holes in steel and $\frac{1}{2}$ -in. holes in wood. It is 13 in. long over all, $13\frac{1}{2}$ in. wide, including the handle, and $4\frac{3}{4}$ in. high. It is fitted with a Jacobs No. 2 A chuck, which the builder has selected on account of its compactness and accuracy. The chuck revolves at a speed of about 700 rev. per min., while the motor shaft runs at 1500 rev. per min. The normal horsepower consumed is $\frac{1}{6}$. Running idle on 110-volt current, the motor requires about 0.8 amperes; drilling in steel about $2\frac{1}{4}$ amperes. The time required to drill through a $\frac{3}{4}$ -in. steel plate is 1 min. and 15 sec. The machine weighs 12 lb. in the direct current pattern of this size. The company is now at work on other sizes for both direct and alternating current, but at present is devoting itself to this particular size as being one of the most common in use.

The New Rockford Hand Miller.

A Combined Vertical and Horizontal Milling Machine and Slotting Machine.

The National Machine & Tool Works, Rockford, Ill., has recently brought out the new type of Rockford hand milling machine which is illustrated herewith. One of its interesting features is the lever and screw feed, but the attachments furnished possess even greater interest and increase the scope of its usefulness. Fig. 2 is a general view of the machine itself, while Figs. 1 and 3 illustrate the vertical milling and slotting attachments, respectively.

The machine is of the customary column and knee type, and is mounted on a substantial base in which there is a cupboard for tools. To be quickly operated the vertical movement of the knee upon the column is by rack and pinion from a lever keyed to the pinion. Micrometer stops are provided for this motion and also for the longitudinal one; those for the latter bear solidly against a post attached to the saddle. The com-

place by the rear clamping screw for the overhanging arm, and can be easily slipped out at the back in an instant.

One of the advantages claimed for this type of construction is that a very rigid support is furnished for the vertical spindle without in any way lessening the capacity of the machine as a vertical miller since the support is set high. For taking angular cuts, the head may be adjusted to the desired position after loosening the three clamping screws. To facilitate setting the base of the flange is graduated in degrees. The spindle is provided with a draw-in collet, having a capacity of $\frac{3}{4}$ in., and there is another one bored to a No. 7 Brown & Sharpe taper. The spindle thus can hold end mills and drill chucks, and as the horizontal spindle is also provided with the same equipment of collets, it is possible to use both simultaneously. The cross and longitudinal feeds are graduated in thousandths of an inch, and thus the attachment is adapted to accurate jig work.

The slotting or shaping attachment is clamped to the column in the same manner as the vertical milling

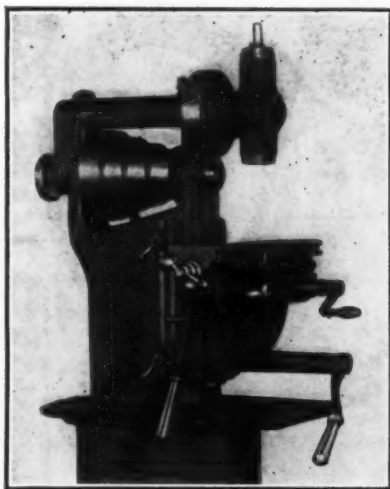


Fig. 1.—The Machine Arranged for Vertical Milling.

bination lever and screw feed for the table, which is plainly shown in the engravings, consists of a worm gear that meshes with the table feed screw, and is operated by a lever mounted on the shaft to which the worm gear is keyed. When it is desired to feed the table by the screw alone, the worm wheel is clamped fast and the feed screw runs in and out over it in the same way as it does with the ordinary stationary feed nuts, and the lever is stationary. When the lever alone is used, the worm wheel is loosened, and it then operates as a gear and meshes with the double thread screw as if the latter were a rack. In this way the quick operation of the longitudinal feed is provided for.

As will be noticed from Fig. 2, the overhanging arm has a stiffening plate or flange mounted at its inner end, which is bolted fast to a corresponding one cast solid with the column. As this flange extends out about $3\frac{1}{2}$ in., it serves as an additional support for the overhanging arm, although that is not the purpose for which it was primarily designed. Its true function, as is shown in Figs. 1 and 3, is to serve as a base for the vertical milling and the slotting attachments. The vertical milling attachment is driven through bevel gearing from a horizontal shaft, which extends to the back of the machine through a sleeve in the holder for the overhanging arm. This sleeve is designed to be held in

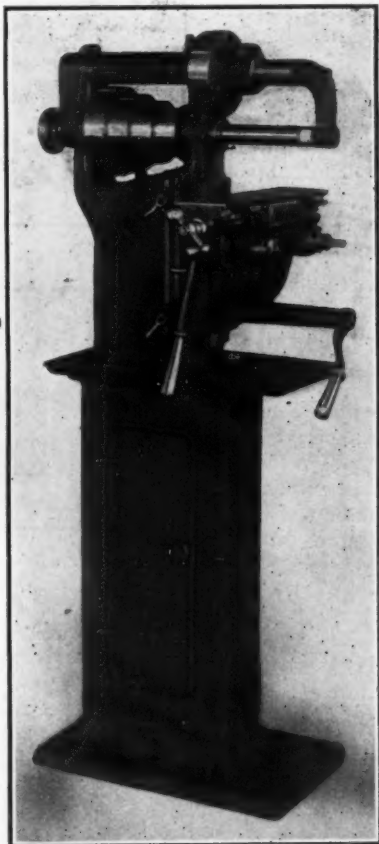


Fig. 2.—The New Hand Milling Machine Built by the National Machine & Tool Works, Rockford, Ill., Arranged for Horizontal Milling.

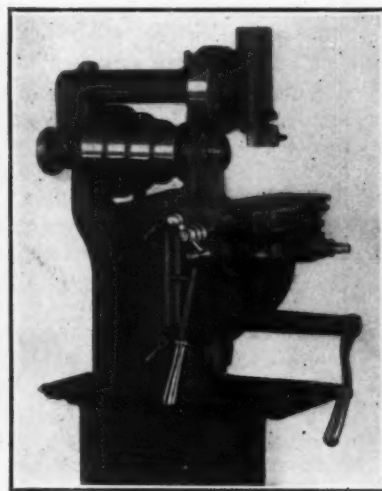


Fig. 3.—The Machine with the Slotting Attachment Applied.

attachment, and can be employed for cutting keyways, planing out dies and doing work of a similar nature. The length of stroke is 2 in., and the tools used have $\frac{1}{2}$ -in. round shanks. The entire attachment can be swiveled to any desired angle, and the tools can be set with their cutting edges on any side. For die sinking and kindred work, the attachment is especially advantageous, as cuts can be taken to a line scribed on top of the work, which is always in plain sight. Thus all

risk of undercutting and destroying the work is eliminated. The connection to the rear end of the main spindle is made in the same way as that for the vertical attachment. The shaft in the sleeve of the overhanging arm is $2\frac{1}{2}$ in. long and $\frac{7}{8}$ in. in diameter, with a $\frac{1}{4}$ -in. keyway extending its entire length.

The Baldt Steel Casting Company, New Castle, Del., has completed additions to its plant which will increase the capacity about 50 per cent. A new foundry building, 80 x 225 ft., has been erected and a 30-ton open hearth furnace built, while the capacity of the producer plant has been doubled. More drying ovens have been added and a new 250-kw. direct connected generator and additional air compressor capacity have been installed. The plant is quite busy on a general line of steel castings.

New Globe Sherardizing Equipment.

Better Work in Shorter Time Claimed.

Ever since the first Sherardizing plant was operated on a commercial basis it has been recognized by manufacturers and users of this apparatus that the success of the process and its application on a very wide scale depended largely upon the reduction in the amount of time required, and the making of the process a continuous one which could be operated without any addi-

tending at right angles to the pit at the right of the illustration which is not shown.

The machines, one of which is illustrated in Fig. 2, consist of three drums mounted upon a car. Each of the drums has a gear at one end, which engages with a worm shaft provided with a sprocket at one end. While the drums are in the oven, the sprocket is on the outside and is revolved by power at about 1 rev. per min. This turns the drums over and over, and constantly brings fresh zinc dust in contact with the articles being treated. It is also stated that in this way the contents of the drum are heated much more quickly than if they

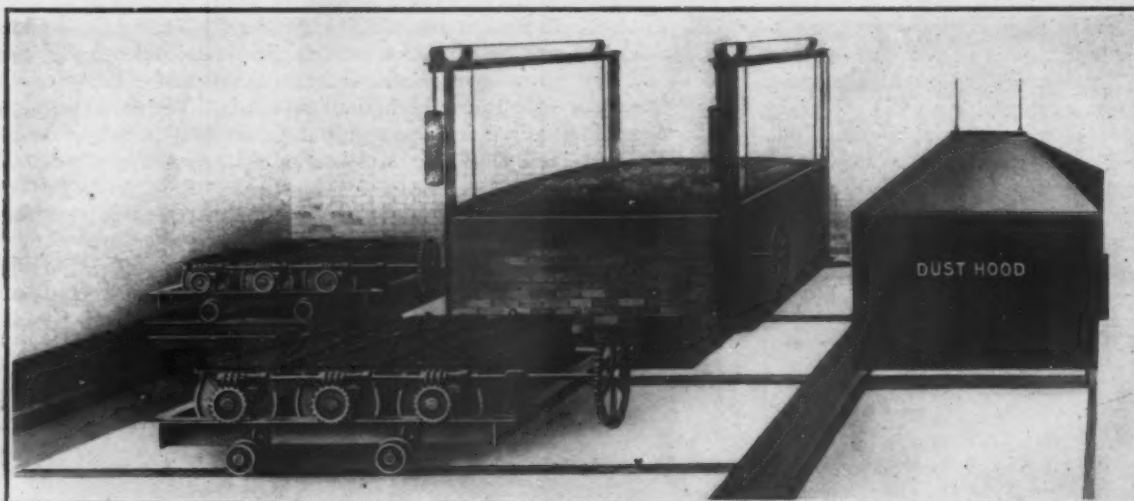


Fig. 1.—Complete Sherardizing Equipment. Built by the Globe Machine & Stamping Company, Cleveland, Ohio.

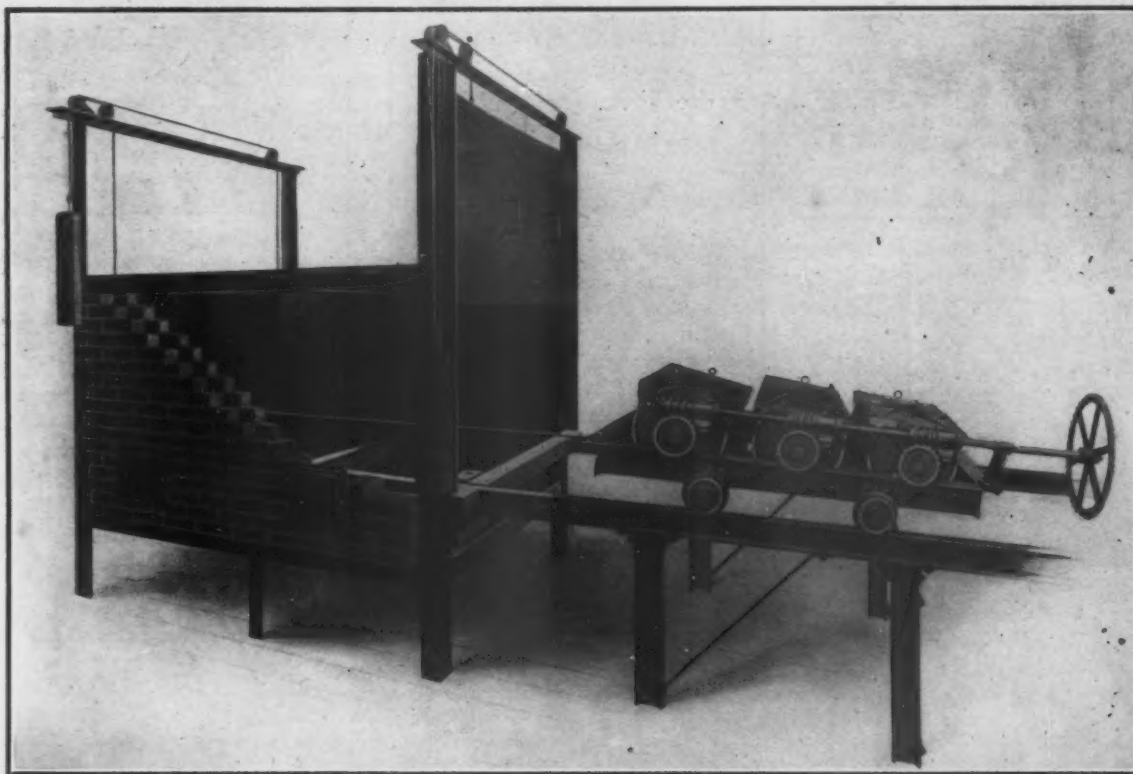


Fig. 2.—View of Sherardizing Machine and Oven.

tional labor throughout the entire 24 hours. The Globe Machine & Stamping Company, Cleveland, Ohio, has devoted considerable time and attention to the solution of the problem, and as a result has produced the equipment shown in the accompanying illustrations. The advantages claimed for it are a reduction in the treatment time to six hours per heat, while at the same time the quality of the work has been improved.

Fig. 1 shows a complete unit, which consists of an oven, four Sherardizing machines and two transfer cars, together with the necessary track. This last forms a rectangle, and there is also a short spur ex-

remained stationary, because the zinc dust is a poor conductor of heat, and the revolving motion brings it to the surface of the drum to be heated instead of compelling the heat to force its way to the center of the drums.

In Fig. 1, in addition to the two machines shown, there is a third one in the oven and a fourth under the dust hood. The last one has just been emptied by removing the tops of the drums and revolving them slightly. This discharges the treated parts upon a screen, which permits the surplus zinc dust to fall through and be used over again in another machine,

while the hood keeps the dust from escaping into the shop.

The operation of the plant is as follows: At the beginning of the cycle of operations, all four machines are empty. Two laborers fill the first one with material and zinc dust, and push it into the oven. They next load the second machine, and run it out on the spur track. These operations have occupied practically all the time up to noon, when the first machine is removed from the oven and replaced by the second. In the afternoon the two remaining machines are loaded, and at 6 o'clock one of them is put in the oven in place of the one run in at noon. At midnight the watchman runs the fourth into the oven, and in the morning it is removed. When the day force comes on duty, it finds the first two machines cool enough to empty and refill, thus starting the cycle over again.

The capacity of the drums is about four kegs of bolts, washer or screws and three kegs of zinc dust each. The ovens can be heated by either gas or oil. The erection of the ovens, the laying of the tracks and the assembling of the machines and transfer cars can, it is stated, be done by ordinary shop labor, and the plant can be operated by two men without any addition to the force previously required.

The Greiner High Speed Riveter.

For riveting different kinds of work, such as general hardware, bicycle chain, typewriters and fittings, sewing machine attachments, hinges, casters, cutlery, saddlery and kitchen utensils, the Charles Greiner Company, New Haven, Conn., has designed and built the high speed elastic rotary blow riveter which is illustrated herewith. An earlier model of this machine was illustrated and described in *The Iron Age*, November 18, 1909. Since then some refinements have been made and a number of improvements embodied in its design. Among the special features are positive rotary action of the hammer rod, elimination of vibration and regulation of the length of stroke and the force of the blow.

The machine is operated by a cup and friction cone at the top. The fixed pulley has on its lower face six cam-like projections spaced at equal distances around its circumference, and these when set in motion by pressing the foot treadle revolve in a horizontal plane and come in contact with a roller set in the top of an offset arm. This contact causes a vertical movement of the spring actuated cylinder in which the hammer rod is hung between two strong springs. The rod receives its vertical motion from the cylinder and strikes a large number of spring cushioned blows per minute while the rotary motion is derived from two sprockets, one keyed on the lower end of the driving shaft and connected by a chain belt with the gun metal sprocket on the hammer rod. The blow is started and stopped instantaneously, and the hammer is always away from the work when the treadle is released. The number of blows may be varied at will by increasing or diminishing the number of projections on the pulley, but for ordinary purposes the machine has been found to operate best with six projections striking about 6000 blows per minute.

As the length of stroke and force of the blow can be regulated, the machine is adapted to a great variety of work and a large capacity in regard to the diameter and length of rivets it can work. In combination with this large number of blows, the hammer spins at a high rate of speed and causes the head of the rivet to be evenly spread so that a uniformly shaped and a nicely finished head is obtained. Because of the elastic blows the riveter is able not only to do the work that a spinning machine would ordinarily be required to handle, but in addition it will care for a class of work that only blow riveters are generally employed



The High Speed Elastic Rotary Blow Riveter, Built by the Chas. Greiner Company, New Haven, Conn.

for. The simple tools used in place of the expensive spinning rolls make it possible to work close to shoulders and bends, and various heights of rivets may be worked at the same setting.

The chuck is fitted to the hammer rod by a reversed taper, and is made to receive a straight shank hammer held therein by a set screw. A large diameter shank is employed to secure the greatest efficiency and easy insertion or removal of the hammer. This, it is stated, is a great improvement over the method usually employed where a narrow taper shank hammer is driven in the end of the hammer rod. These hammers soon crystallize and break at the neck of the shank and cause trouble and damage to the hammer rod by wedging in it.

The machine has a compound foot treadle which enables the operator to always have the blow under perfect control. The front of the machine is faced and grooved to receive a tongued table of either the horizontal or vertical type, and the tables are interchangeable. Often it is an advantage to have both tables, as then the greatest variety of work can be handled. If desired a lower revolving fixture which strikes light blows can be furnished for use when both heads of a rivet are to be formed simultaneously.

Four sizes of riveters are built; the following table gives their principal dimensions and specifications:

	No. 0.	No. 1.	No. 2.	No. 3.
Floor space, inches.....	17½ x 12	18 x 12	22 x 18	20 x 24
Total height, feet and inches..	4 5	4 7	5 2	5 0
Depth of throat, inches.....	6	7½	9½	12
Hammer to head of machine, inches	4½	5½	5½	5½
Working height of hammer, in..	35	35	42	44
Adjustment of table to hammer, inches.....	22	22	27	27
Hand screw adjustment of table, inches.....	2	2½	2	2
Maximum diameter of rivet, inches	¾	¾	¾	¾

It is claimed that the riveter is strong, rigid and reliable; that it possesses the features necessary to economy, and that because of the high speed at which it is operated the work is produced at a much lower cost than in any other machine of this type.

The William B. Pollock Company, Youngstown, Ohio, recently completed the building of No. 1 blast furnace of the Andrews & Hitchcock Iron Company at Hubbard, Ohio, and is now building the new C furnace of the Youngstown Sheet & Tube Company at Youngstown, Ohio, new No. 4 furnace for the Republic Iron & Steel Company at Haselton, Ohio, and new No. 4 at the Central furnaces of the American Steel & Wire Company at Cleveland, Ohio.

The New Oesterlein Universal Milling Machine.

Equipped with Improved Feed Box and Dividing Head.

The Oesterlein Machine Company, Cincinnati, Ohio, has recently brought out a heavier type of its No. 25 universal milling machine. The principal changes in the design were made in the column of the machine in

two other gears, rides on this sprocket shaft. The lower lever on the feed box shifts these gears, so as to mesh with either of the gears marked X, which are secured to the intermediate shaft. A cone of gears is also secured on this intermediate shaft into any one of the gears of which the intermediate tumbler gear, T, will mesh. From the tumbler gear shaft, the power is transmitted through the universal joint to the gears on the knee, where the automatic longitudinal, cross or vertical feed is engaged. The gears in the feed box run in oil, and provision is made to drain the oil and

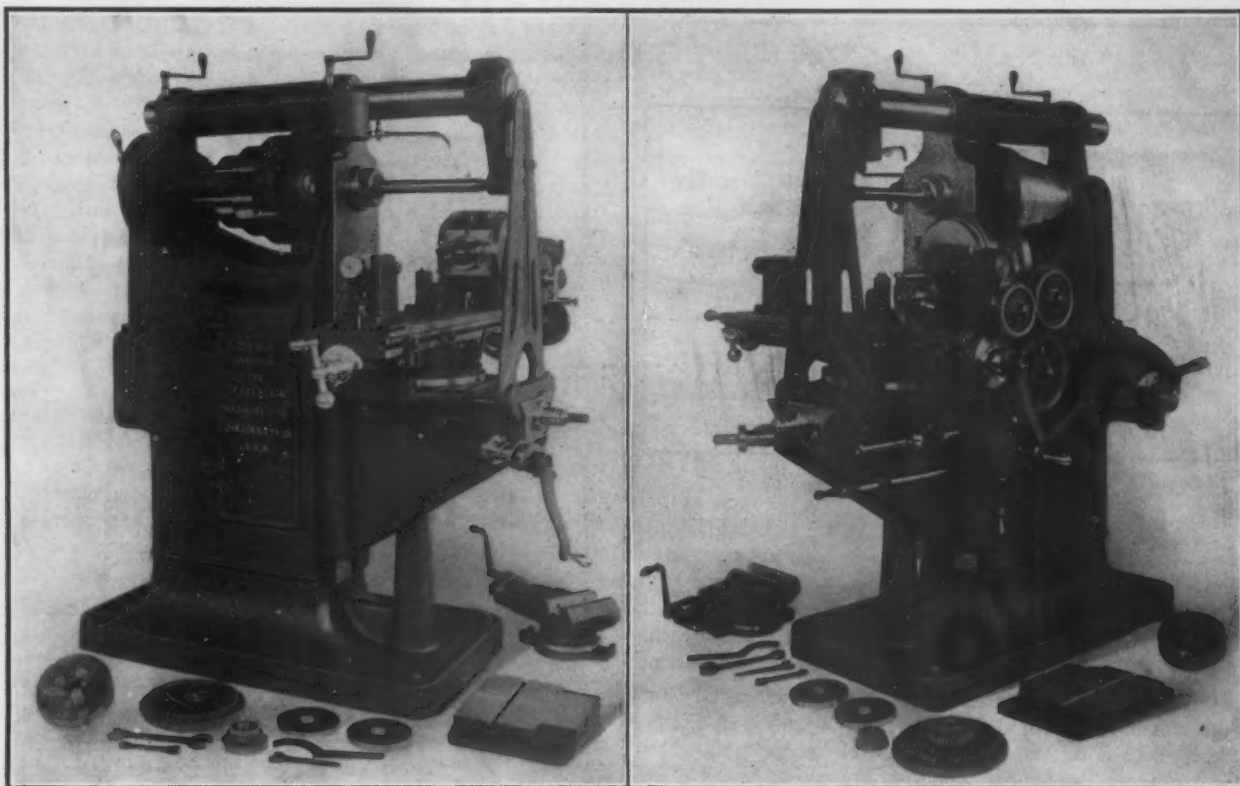


Fig. 1.—Two Views of a New Model of the No. 25 Universal Milling Machine, Built by the Oesterlein Machine Company, Cincinnati, Ohio.

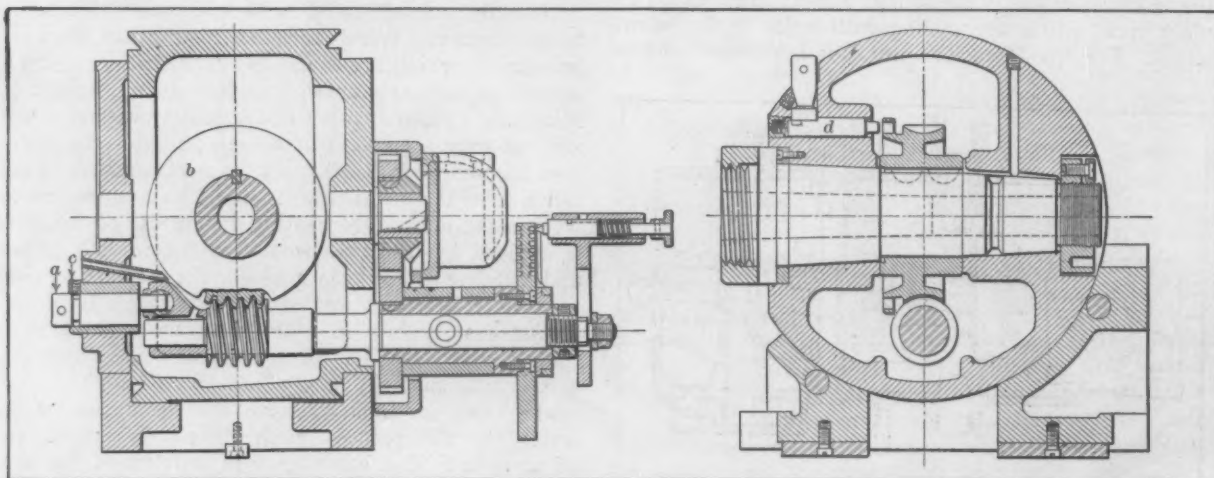


Fig. 2.—Sectional Elevations of the Universal Dividing Head.

the feed box and the dividing head. As will be noticed from the illustrations, the main parts are of large proportions and the entire design is noticeable for its simplicity and rigidity. Fig. 1 shows two views of the machine, Fig. 2 two sectional elevations of the universal dividing head, Figs. 3 and 4 the front and rear of the head, respectively, and Fig. 5 a section through the feed box.

The automatic table feeds are transmitted from the spindle through a roller bearing chain to the sprocket wheel of the feed box. Referring to Fig. 5, it will be noticed that a sliding gear, on which are mounted

put in clean oil easily. A direct reading index plate is attached to the feed box, from which the exact amount of feed per revolution of the spindle is read.

The elevating screw is provided with ball bearings, which insure ease of operation. It does not extend below the base when at its lowest point. The spindle nose is slotted to drive arbors and other tools positively.

The universal head is designed for dividing work in any position from 10 degrees below the horizontal to 10 degrees beyond the vertical, and it is furnished with dividing mechanism for spiral cutting. This head can

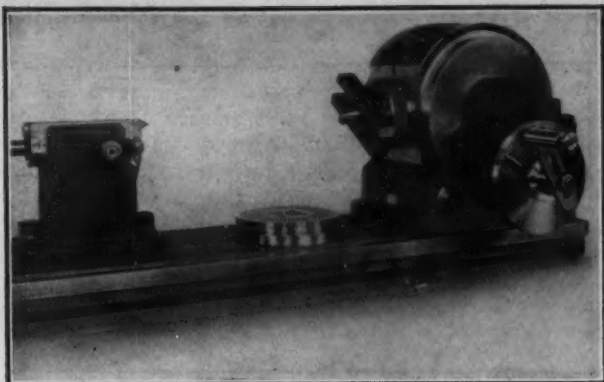


Fig. 3.—Front View of the Universal Dividing Head.

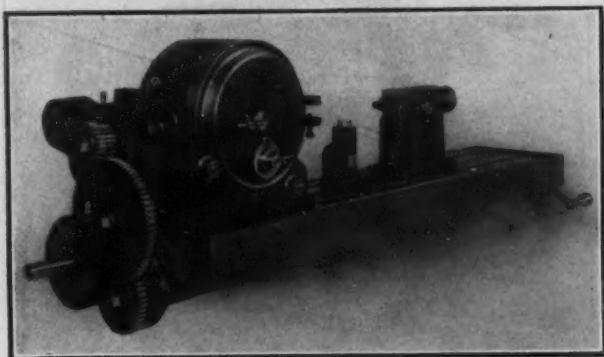


Fig. 4.—Rear View of the Universal Dividing Head.

be securely clamped in any position by two bolts with V blocks. These are turned to the same radius as the V on the body, and are spaced at such a distance as to make the joint rigid. The dividing crank is fitted on the worm shaft, thus eliminating the gearing generally used for dividing.

The manner in which the worm is disengaged from the worm wheel for direct indexing is shown in Fig. 2. A half turn of the engaging crank *a* disengages the worm from the worm wheel. The quick spacing device to divide work into 2, 3, 4, 6, 8, 12 and 24 divisions is one of the features of this head. The spindle consists of 24 holes drilled in the worm wheel, *b*, and the front shoulder of the spindle has 24 graduations in plain view, which are in line with holes in the worm wheel. The spindle spacer pin, *d*, is hardened and has

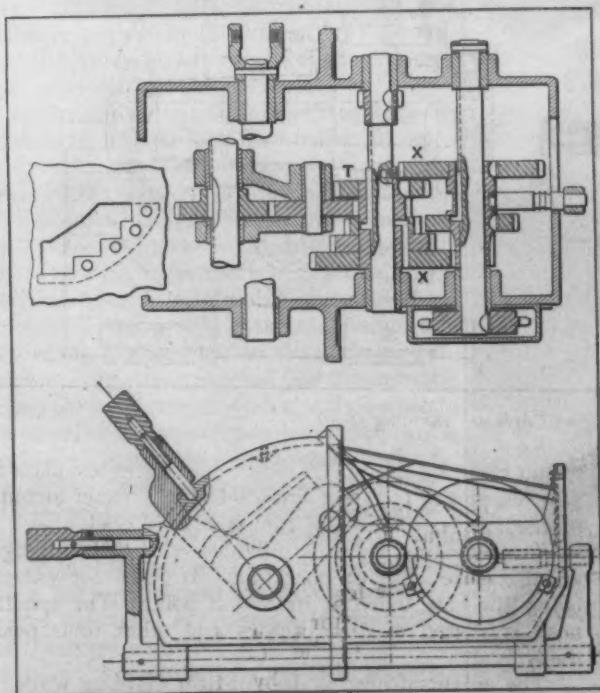


Fig. 5.—Sectional View of the Feed Box.

a tapered point. This pin is actuated by a crank, as shown in Fig. 2. The worm shaft and worm are of tool steel and are made in one piece, and the worm wheel is of bronze. An eccentric bush, *c*, is provided to take care of any wear between the worm and the worm wheel by raising the engaging crank and also the worm.

When the universal head is used for dividing work the sleeve and plate are held stationary by locking the sleeve to the trunnion. The spindle can be clamped by a wedge pin, provided at one end with a 60-degree angle, to fit a similar groove turned in the spindle. A taper bearing extends the entire length of the crucible steel spindle, and wear is compensated for by a split nut on the back of the spindle. For spiral cutting, the work is caused to rotate by connecting the spindle to the lead screw through the gearing shown at the left of Fig. 3.

A complete set of change gears, three dividing plates, a tail-stock, and a center rest are furnished with this head. With these three plates, all divisions up to 100, all even divisions and those divisible by 5 between 100 and 200 and a number of others can be obtained. The tail-stock is so arranged that it can be swiveled to any angle for milling taper work.

A New Method of Electric Welding.

The Mechanical Mfg. Company, Philadelphia, Pa., which was recently succeeded by the Hub Machine, Welding & Contracting Company, 621-623 Cherry street, the same city, has developed a method of electric welding for which exceptional merit is claimed. The process is an adaptation of a German method which has been in successful use in welding cast or wrought iron and steel and copper. One of the particular advantages is that the burning of the metal is avoided.

The metal of the broken casting is used as one of the electrodes and the other is a carbon pencil. Direct current is used, flowing from the metal across an air gap to the carbon electrode. The current is turned on until the material reaches the melting point, so that the fractured edges are entirely melted. Then new metal of similar composition is added by melting a rod of it in the flame of the arc, while the metal surrounding the broken part remains molten.

Usually a rough mold is built around the fracture to be welded. When ends of castings or lugs are broken off, which are either too small to be welded or have been lost, new ones or extensions are welded on. A mold of carbon or other fire resistive material is used and the excess metal is machined off after the operation is completed. In this way it is claimed no honeycombing of the metal results and a clean, homogeneous weld is obtained. Overheating or burning of the metal is avoided by using a rheostat to control the current and increase or decrease it to suit the work to be done.

Broken test bars welded by this process have on a second test broken in other than the welded parts. Satisfactory work has been done on cast iron pieces 3 x 7 in. and 1 3/4 to 10 in. Steel stone crusher shafts 6 in. in diameter have also been successfully welded by this process, while deficiencies in the size of parts have been made up. An instance of the latter was the adding of 3/4 in. of metal to the end of a roll 10 in. in diameter. This process, it is claimed, is of particular value in work where it is impossible to obtain duplicate parts or castings, and has been extensively used for repairing parts of machinery made abroad.

The Empire Iron & Steel Company, Niles, Ohio, manufacturer of black and galvanized iron and steel sheets and corrugated roofing and siding, will close down its plant for two or three weeks, during which time a large new engine and two additional hot mills will be installed.

The Mitchell Cantilever Grain Elevator.

An Interesting English Floating Elevator.

BY AUGUST F. BOCK, BERLIN.

Some important advantages are claimed for a new type of floating elevator designed by Alfred Mitchell, engineer of the London Grain Elevator Company, Ltd., for its use. The elevator is employed for discharging grain from ships to lighters, and is designed to work alongside of or end-on to the ship. When working in the latter position it can deliver grain to two barges at the same time. The conditions of taking grain from ocean going steamers vary considerably as regards the size of steamer and the position and manner in which the grain is stored. When discharging is commenced the grain is probably at a height of 15 or 20 ft. above the water line. When the ship is entirely discharged it is necessary to lift the bottom of the elevator over the highest point of the coamings, which may be 40 ft. above the water line. Thus the lower or digging end of the elevator must have a vertical range of some 60 ft., and the clear length of the leg below the supporting arm must be sufficient to reach the bottom of the deepest hold of any ship, which may be 40 ft. for a moderate sized steamer and considerably more for one of the ocean liners. The width of the ship is also another important factor. The majority of ships are divided by longitudinal bulk heads, and in the afterhold by a tunnel over the propeller shaft. It is, therefore, important that the elevator should be easily able to work on either side of the ship's center line.

The London Grain Elevator Company has several types of machines in operation. In the ordinary type of self-contained grain elevator, there is an arm of considerable length which is fitted to the top of a tower and counterbalanced by a weight at the rear end. The first step in the development of this cantilever elevator was the bringing down of the back balance weight and connecting it by links and levers. If the lever is equal in length to the rear end of the jib, and the suspending link equal to that portion of the post above the link, there is a parallel motion whereby the



Fig. 2.—The Mitchell Elevator with Leg Raised.

weight partakes of the same movement as the back end of the jib and balances it as before. This arrangement reduces the top weight by about 400 ft.-tons in an ordinary sized machine, and in turn decreases the size of the barge or pontoon carrying it. The final modification is where the post, which was rigid in the earlier types, is supported by a trunnion at the top of a frame placed on a turntable on the deck. With this arrangement it is possible to shorten the length of the cantilever arm by the amount by which the vertical post can swing forward and thus the weight of the jib is not only lightened, but the amount of weight required to balance it is also considerably reduced.

If the elevator leg is perfectly balanced by the jib balance weight, the center of gravity of the whole combination will pass through some definite point on the upper side of the post. When this point is found, it becomes possible by ballasting the lower end of the tilting post to bring the center of gravity of the whole combination to the middle of the trunnion pin, at which point it will remain whatever be the position of the elevator. It will be seen that not only have the weights been brought down to a very low point, but the compound balance described enables the elevator to be worked alongside, or to work in broad or narrow ships without any tendency to give the barge a list or alter the trim, so that a smaller barge can be used to carry it. The full weight of the elevator leg is not absolutely balanced, a certain excess being allowed on the elevator end for sinking the leg into the grain.

The elevator which has been constructed for the London Grain Elevator Company by the New Con-

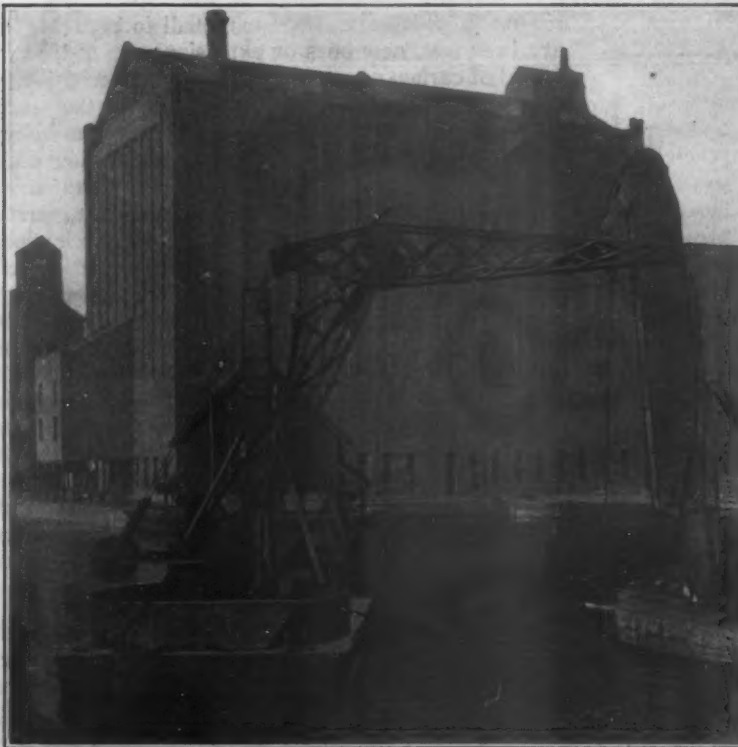


Fig. 1.—A New Type of Cantilever Grain Elevator Built by the New Conveyor Company, Ltd., Smethwick, England.

veyor Company, Ltd., Smethwick, England, is shown in the accompanying illustrations. Fig. 1 shows the elevator completely extended to its maximum range, Fig. 2 illustrates the leg in its raised position, while Fig. 3 shows the cargo of a steamer being discharged into bags. The leg can be telescoped, and has a clear length, when extended, of 41 ft. under the suspending pin. The buckets are carried upon an endless chain and are so arranged that as the leg is lifted the exact amount of chain that is let out on the front of the leg is taken up in the back, so that the chain remains of the same length and of even tension throughout. The buckets are spaced 10½ in. apart, have a capacity of 100 tons of wheat per hour at full speed, and deliver at the rate of 320 buckets per minute. The elevator is carried at the end of a cantilever jib 25 ft. long, center to center, and 9 ft. 6 in. at the back end. The weight of the leg is partly balanced by the balance weight at the back connected by parallel bars and

into craft as required. It is stated that the time required for putting the machine into a ship is about four minutes as compared with the time required to ship and unship the portable machine previously employed which was from two to four hours. As will be noticed from the illustrations, this combination of the two levers and the telescopic leg gives a great range of motion. The precise angle of the jib is controlled by means of an electric winch and wire hauling gear acting on the back end of the jib, while the tilting of the post is performed by means of a screw and nut carried in a bracket near the trunnion pin on the post.

All the controlling motions are performed by series wound motors of 4 hp. each, and the driving of the elevator is done by a 20-hp. motor attached to the turntable. Direct current is generated on board by a Crossley suction gas engine, belt connected to a 110-volt dynamo. All the electrical equipment was built by Holmes & Co., Newcastle-on-Tyne. The deck elevator

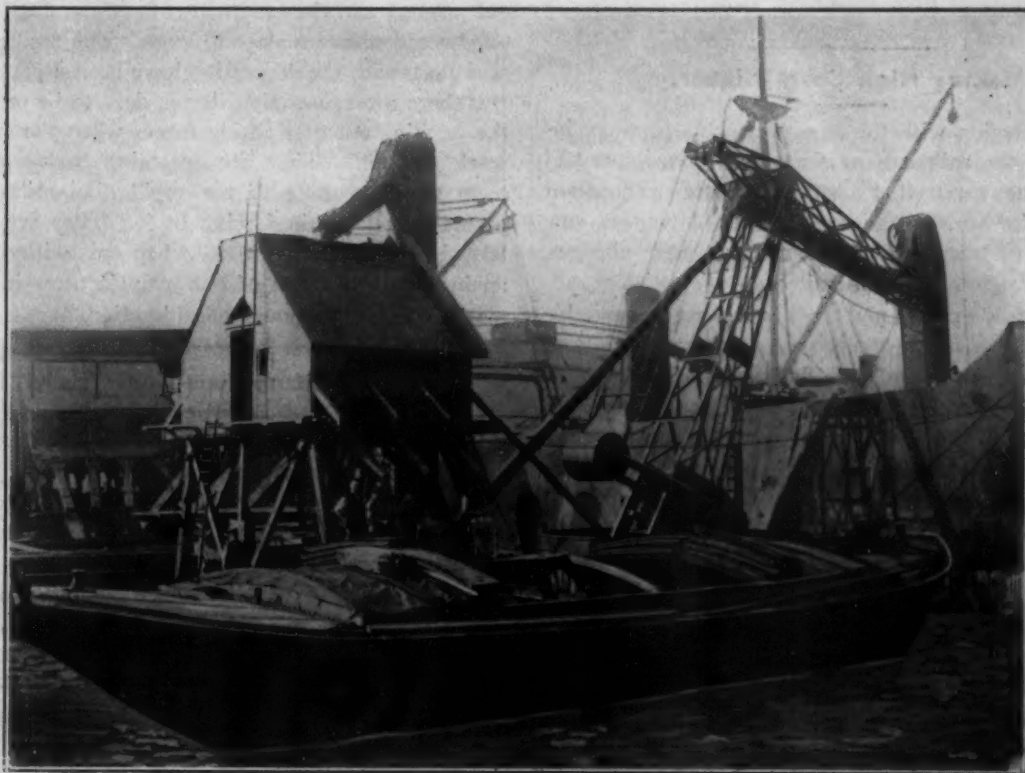


Fig. 3.—Unloading a Grain Steamer and Bagging the Cargo with a Mitchell Elevator.

lever, as shown. The grain is discharged from the elevator head by adjustable chutes on to an endless conveyor belt carried on the inside of the jib. This belt is of canvas with rubber on one side, and is provided with diagonal ribs on the side which carries the grain to facilitate the grain being lifted directly up when the jib is lowered to its extreme position. These ribs are placed diagonally to allow them to run freely over the supporting rolls which carry the slack side of the belt. At the top of the post this belt discharges into a second receiver which discharges through the long telescopic chute into a boot of a second elevator which is placed on the deck. This in turn raises the grain and discharges it into the weighing house or hopper, from which it is delivered to the craft.

The elevator jib is carried at the top of the inclined post, which in turn is supported by the trunnion pin at the top of the frame which rotates upon the turntable, whose supporting ring and rack are secured to the bottom of the craft. The length of the tilting post above the trunnion is 30 ft., and the height of the trunnion pin above the bottom of the barge is 17 ft. 3 in. The weighing house is provided with six Avery's patented automatic grain scales of 250-lb. capacity each, which can discharge into sacks, as shown in Fig. 3, or in bulk

is driven by a countershaft in the engine room and a chain belt.

Some much larger machines than the one described are being constructed at the present time which are provided with additional means of delivering grain ashore as well as to craft by means of a portable conveyor belt and telescopic chute. The elevator is driven in this case by a motor attached directly to its head, thus doing away with all gearing. The grain is also delivered by means of chutes fixed inside the post and discharged by swiveling chutes into the second elevator, which is also driven by a direct-connected motor. The generating plant consists of a high-speed direct-coupled gas engine and suction gas plant, generating direct current at 110 volts. The whole apparatus is controlled by one man, located in a cab on the turntable.

The Flannery Bolt Company, Pittsburgh, is completing extensive additions to its plant at Bridgeville, Pa., consisting of steel frame and brick buildings that will about double its capacity in iron storage, forge shop and power house. Babcock & Wilcox water tube boilers are being installed. The new additions will be ready to operate about September 1.

THE IRON AGE

Established in 1855.

New York, Thursday, April 7, 1910.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, - - - - - PUBLISHER
14-16 PARK PLACE, NEW YORK

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MECHANICAL EDITOR

Making High Costs Higher.

In connection with the announcements of wage increases by the railroads of the country, we have had repeated once more what has been a matter of constant iteration in all discussions of such advances—the necessity of advances in freight and passenger charges. The increased cost to the railroads of the wage advances already granted and those which seem inevitable is put at \$50,000,000 to \$60,000,000 a year, and it is conceded that they must now find ways of adding to their revenue to meet this heavy additional charge. It is quite usual, when the question comes up of ways and means of providing for an increased cost of production, to propose that the price to the consumer be advanced. That was what the anthracite miners' committee told the operators in 1902, when asked where the money was to be had to cover the wage increases demanded.

The situation in which the country now finds itself is unparalleled. Demands for wage increases were never so widespread and so insistent. There is a general disposition to grant them, and apparently no serious opposition to the contention that they must be provided for by higher charges for that into which the better rewarded labor enters. We have now such a wave of complaint and protest against high prices as the country has not seen in this generation, at least. Some of it is exaggerated and due to the ease with which the average member of the community joins in a general hue. But the fact remains that this is the most discussed of all the things about which the public mind is exercised; yet, strangely enough, little or no effort is made to cure high prices. Chiefly what is being done is to agree that they must go higher.

The history of trade booms is that the transition from the high prices they bring to the lower levels that follow is not by an orderly process of adjustment, but rather through conditions that are not only not welcomed by financial and industrial interests, but are positively calamitous. In some of the proposals now being urged by those who assume to have located the responsibility for current high prices, there are admitted possibilities of disturbance. Tariff overhauls and trust dissolutions plainly belong in this category. We have not yet seen a serious suggestion for the curtailment of gold production, yet that would be a logical remedy if abundance of gold is exercising the untoward influence so confidently asserted by many.

There are two methods of relief, which involve a minimum of disturbance to industry and trade, and that in any event cannot bring calamity; and yet it must be admitted they are less likely to be chosen than any of the legislative cures so actively agitated. They are homely remedies. Let us call them curtailment of extravagance and increase in efficiency. Their honest application for a year to the problem that is now filling the country with unrest would work wonders. Of the former much has been said in the past decade of rapid accumulation of fortunes, but the contagion of quick riches has poisoned the popular mind against it. Concerning the lack of efficiency in wage earners not so much has been heard since 1907. Then it was the crying evil of all industrial operations. In shop after shop output per man declined under the pressure to get out product and the ease with which any man who applied could secure a place to work. The readjustments that came with the depression have been a partial cure. But there are causes that lie too deep to be reached by the weeding out of working forces when the supply of work falls off. They are operating to-day and they have much to do with the rapid diminution of our favorable balance in foreign trade. They are particularly important at this time, when our ability to place an increasing amount of our manufactures in foreign markets is a paramount consideration.

The Bituminous Coal Trade.

The industries comprised in the constituency of *The Iron Age* use a very considerable part of the bituminous coal that is mined in the United States, and the recent suspension of mining operations is, therefore, of more than passing interest. Fortunately for the iron industry, the fields which produce coking coal are not controlled by the miners' union. While the ordinary consumer of steam coal can carry two or three months' supply, this is impracticable in the case of important iron and steel producers, and the interruption of their supply of fuel would be most serious.

There are advantages to mine operators in having all the competing mines in any district operated on a wage scale which fixes a uniform rate per ton. But when the coal supply of important manufacturing sections is controlled by a closed shop agreement between the mine operators and the workmen there are disadvantages which call for consideration. One of the most serious difficulties is the inevitable struggle on the part of the union to obtain a higher rate of wages each time the contract is renewed. The means employed by the union in enforcing its demand is cutting off the entire supply of coal until public necessity compels the operators to yield the increase demanded. Meanwhile the union has advantages in holding its forces together and maintaining its position. It is practically irresponsible in law for its acts and its committees cannot be successfully prosecuted for lawlessness, while the operator is amenable both to the law and public opinion. These conditions combine to increase the cost of coal to the public each time there is a revision of the wage scale.

Contrary to popular belief, the mining of bituminous coal is one of the least profitable industries in the country. Only a small number of coal companies earn net profits which compare at all with those of manufacturing or commercial enterprises, or of railroad

transportation. A few mines pay good returns by reason of advantages in location and mining cost, but these advantages often accrue to the railroad more than to the operator, as they are considered in the adjustment of rates. The railroads are the largest consumers of coal, and their contracts are often let on a basis which proves profitable to the mines that are favored. The operators who do not have unusual natural advantages or railroad contracts are seldom able to earn steady returns on their investment. For several years prior to last winter the operators who depend upon the open market as an outlet found the business particularly unsatisfactory. The past winter the business proved very profitable, as coal not under contract generally sold at a premium, at first to meet the heavy consumption during the unusually severe winter, and later to supply the demand from manufacturers and other consumers who were under the necessity of accumulating stocks to carry them over the expected suspension in their supply. One profitable winter, however, has not made up for the losing years which preceded it. The unnatural stimulus given to soft coal mining by the anthracite strike has resulted in constant overproduction ever since.

Fluctuations in the cost of production are responsible to a great extent for the unhealthy competition which prevails in the coal trade during dull periods in the market. The miners are paid a fixed rate per ton, but this often represents less than half the total cost of coal loaded on cars. The pumping, ventilation and general upkeep of the mine must go on whether it is operated at full or half capacity, and capital charges are not affected by the amount produced. If a mine is capable of economic production at the rate of 1000 tons per day, and the sales department is only able to dispose of 500 tons on regular contracts, there is a great temptation to produce more than 500 tons per day and sell the surplus at concessions on the open market in order to reduce the cost and thus increase the profit on the 500 tons which is under contract. In dull periods spot coal is usually sold at a discount from contract prices, as a result of this temptation. This depresses the market and leads to contracting with regular consumers at prices which show a very small margin of profit, and the majority of the operators drift along through the year hoping for an active demand such as prevailed the past winter. As a matter of fact, under the conditions prevailing in the industry for a number of years the incentive to avoid strikes and curtailment of output has not been such as to warrant the operators in going to great lengths in the making of concessions.

Freight Concessions as Price Cutting.

The stiffening of freight rates on the part of the railroads and transportation companies generally should have the effect of strengthening the policy of the machinery builders in demanding that all sales shall be f.o.b. the factory. Costs are creeping up in such a manner as to compel a rigid insistence that all details having to do with prices shall be carried out to the letter. Some of the most successful machinery builders, notably in the machine tool trade, have been as adamant to the demands of customers for this class of concessions, good times and bad, and have lost nothing by it. On the contrary, they undoubtedly have

been large gainers. In maintaining prices this factor is one of too much importance to be neglected. Where customer and manufacturer are widely separated territorially, the payment of freight by the latter is equivalent to a material decrease from the list. Exceptions should be made only under conditions so unusual as to place the transaction above criticism.

Makers' Name Plates on Reconstructed Machines.

In such times as the present, when second-hand machinery is bringing unusually high prices, there is a good profit in rebuilding used machinery, and much work of the kind is being done throughout the country. Large shops devoted exclusively to such work are in operation, and there are firms that do nothing else but buy, repair and sell second-hand equipment. Even the scrap heap has been resorted to in the quest for repair material, and machines and parts of machines that in other times would be retired to the junk yards are recruited for fresh service. Second-hand machines being in high demand, the work of reconstructing them benefits trade and should be encouraged. Many manufacturers who have been unable of late to get early deliveries of new machines would be sorely handicapped were they unable to add to their manufacturing facilities by the use of second-hand equipment.

There is one phase of the machinery construction business, however, that calls for consideration, and that is the use of makers' name plates. It frequently occurs in rebuilding an old machine of one make that parts of machines of other makes are substituted for worn out working sections of the machine that is being put into shape for service. While the major portion of the reconstructed machine may have been made by one house, other parts, and, perhaps, important parts, of other makes are put into use in connection with it. Many rebuilt machines are then sold with the name plates of the makers of the larger portion of the machines attached to them. Sometimes this second-hand equipment does not give even the limited service that might be expected of it, and sometimes, too, buyers of second-hand machinery expect too much of the equipment. In any event the buyer of the machine is often inclined to place the blame for its unsatisfactory service on the maker rather than on the party from whom he purchased it, with the consequence that the builder whose name plate unfortunately appears on the apparatus suffers in prestige. The men in charge of the operating departments of plants are not inclined to go into the ethics of the matter; they simply condemn that make of machine by calling attention to the fact that it does not give good service. Consequently, when the owners of the machine in question take up the matter of buying new equipment they might be inclined to refuse to consider that make of machine.

Of course, many of the inquiries for second-hand machinery come from people who require, perhaps, a milling machine, a gear cutter or a planer of a certain design, and the selling of complete second-hand machines with name plates attached is an entirely legitimate and proper practice. Buyers of second-hand machinery should be charitable in their criticism, and sellers should make it clear in disposing of their goods that parts of other makes have been applied to the

machine in question where substitution has been employed. The practice of collecting from the scrap heap a pile of discarded material and constructing a machine from it is also legitimate, but it is certainly unfair in such cases to attach a maker's name plate to an assorted collection of equipment of that kind.

The Need of a Better Patent Office System.

Manufacturers and inventors have a vital interest in the effort of the Commissioner of Patents to secure legislation amending the American patent laws so that the Government would give a better guarantee with patents issued by it. In a hearing before the House Committee on Patents last week the commissioner said: "We are handing out to-day, in 60 per cent. of the cases, patents which are worthless in whole or in part." He contrasted this condition with that of the German patent office, where applications are so thoroughly searched that the novelty of an invention is guaranteed, throwing the burden of proof on the infringer rather than on the patentee.

In some States a real estate title is guaranteed by the Commonwealth; the State makes itself financially responsible for any flaw which may be developed after the special court has decided the title to be clear of all incumbrances. A patent and a piece of real estate, it is true, are very different propositions. But, leaving out the financial responsibility, a Government guarantee is not at all an unreasonable benefaction to the holder of a patent or to a purchaser of patent rights. Costly litigation would be much less frequent. A patent would more closely represent tangible property. A purchaser of machinery or tools or articles embodying mechanisms would be saved the annoyance which arises occasionally through the existence of patents which are under contention. It is difficult to find a reasonable objection to the plan. Whatever additional burden of cost of maintenance of the Patent Office might be entailed would undoubtedly be small when compared with the direct saving to the industrial community.

Workers Reject the Furness Co-operative Plan.

Much favorable comment has appeared on the experiment in co-operation carried out last year at the shipyards of Furness, Withy & Co., Ltd., at West Hartlepool, England. In a public address some weeks ago Sir Christopher Furness, the author of the plan, expressed confidence in its continuance, the understanding then being that a vote to be taken by the labor unions involved would be favorable. A London cablegram of April 3 brings information, however, that a final vote taken on the day preceding had shown a majority against continuing the co-operative scheme. The workmen complained that their expectation of full employment under the new regime had not been realized. Probably much more influential in the adverse decision was the sentiment among labor leaders that profit sharing systems are inconsistent with the principles of labor unions and therefore are not to be encouraged.

Under the tentative arrangement in force at West Hartlepool the workmen were to receive 9 per cent. interest per year on the sums they invested in the business, besides receiving their regular wages. On

their part the workmen agreed not to strike, but to settle their differences through a council on which both the owners and the men were represented. In his original announcement of the plan, Sir Christopher Furness emphasized the mutual profit arising from immunity from strikes. In the shipbuilding industry these had been frequent and attended with great loss. Many of them also were "sympathetic," a trivial dispute with one union being sufficient at times to cause a general tie-up. It was perhaps too much to expect a proposal emanating from the owners' side to get a hospitable reception from British labor union leaders. The privilege of striking and of tying up a plant with important contracts on hand is too dear to be surrendered even in exchange for a better return to the workmen and the fullest employment possible under existing trade conditions. As we understand one of the grounds of the recent adverse vote, the workmen expected the management to run its yards to full capacity without regard to the current supply of orders for new ships. But even so good a thing as co-operation cannot work miracles, and perhaps a year's peace was as near an approach to one as we had any right to expect.

The Minnesota Iron Ranges.

G. O. Virtue, Ph. D., in Bulletin No. 84 of the Bureau of Labor, Department of Commerce and Labor, presents a study of the iron ore mines of Minnesota. He deals with the history of the development of the mines, the amount of ore produced, and the transportation facilities, together with a more detailed discussion of the economic condition of the employees of the mines, a large percentage of whom are of foreign birth.

According to figures furnished by the Oliver Iron Mining Company, the principal producer of iron ore in Minnesota, only 23.2 per cent. of the employees of that company on June 1, 1909, were Americans. The principal foreign born employees numerically were Austrians, who constituted 32.5 per cent., Finns 15.9 per cent., Italians 11.1 per cent., and Scandinavians 10.2 per cent. Tables are given for 1907 showing the conjugal condition of the foreign born employees, length of residence in the United States, ability to speak English, and number naturalized. Only 48.6 per cent. of the foreign born employees could speak English, and 42.9 per cent. of those who had been in the United States five years were naturalized; of those over 21 years of age reporting their conjugal condition 51.6 per cent. were married.

The article discusses the characteristics of the various nationalities employed, wages and cost of living, housing conditions, home ownership, educational facilities and labor organizations. The various methods of mining the ore and the working conditions are described, and statistics are given of fatal and nonfatal accidents, with a discussion of their causes and the provisions made for mine inspection. A brief account is also given of the hospital service and the aid funds and insurance systems provided by the companies.

The First Bessemer Steel Bars.—A valued correspondent is desirous of ascertaining who made the first Bessemer steel bars in this country; who sold the first carload of such bars, and who the buyer was. Undoubtedly the first Bessemer steel bars produced were rolled from steel having the same carbon contents as steel rails and were therefore a radically different product from the soft steel bars now in such general use. It would seem, therefore, that it would be desirable to have historical light on the early manufacture of these two classes of product. We will be greatly pleased to hear from our readers on this interesting subject.

The Southern Supply and Machinery Convention.

The joint convention of the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association is in session this week at Jacksonville, Fla. The opening session was held Tuesday morning and the deliberations will continue until Thursday. An interesting programme has been prepared. This includes, at the opening session, addresses by President H. C. Clark of the Southern Dealers' Association and President John Trix of the American Manufacturers' Association. The afternoon session was largely given to the reading of reports of the officers and appointment of committees.

On Wednesday morning separate executive sessions were held. At the meeting of the Southern Dealers' Association the subject of "Experience With and Benefits to Be Derived from Local Organization" was discussed, and a paper was read on "Employment of Salesmen on Commission or Profit-Sharing Basis," by E. Howard Smith, vice-president and general manager Superior Supply Company, Bluefield, W. Va. The American Manufacturers' Association at the same time discussed the following subjects: "Should Manufacturers Pay for Representation in Dealers' Catalogues, and, If So, to What Extent?" and "Mutual Obligations of Manufacturers and Dealers Under Exclusive Agency Agreements."

A joint executive session was held Wednesday afternoon, when discussions were opened as follows: By W. P. Simpson, C. T. Patterson Company, New Orleans, La., on "What Advantages Have Been Derived by the Adoption of Resale Prices, and Should the Same Be Continued and Supported by the Jobbers?" and by N. A. Gladding, vice-president E. C. Atkins & Co., Indianapolis, Ind., on "Practical Results of Adoption of Resale Prices."

Separate executive sessions were arranged for Thursday morning, when the two bodies were to complete unfinished business, take up new business, receive reports of resolutions, committees, and elect officers. Arrangements were made for a joint executive session Thursday afternoon on a steamboat while sailing down the St. Johns River.

Following is a telegraphic report of the first day's proceedings from a staff representative of *The Iron Age*, Percy A. Ware:

JACKSONVILLE, FLA., April 5.—Machinery and supply selling men from 14 Southern States and manufacturers from nearly every State in the Union met here this morning when the joint convention was begun. This is the ninth annual meeting of the dealers' association and the sixth convention of manufacturers, and it is by far the largest joint gathering ever held by the associations. Although the sessions to-day were largely given up to organizing the convention and other preliminary business, enough was said to indicate that the following meetings are to be largely devoted to questions affecting dealers and manufacturers which are of more than ordinary importance. The gathering is a representative one, the manufacturers and dealers present handling lines ranging from belting to heavy engines and machinery. There was an especially large attendance of dealers, and the fact that the Georgia-Florida Saw Mill Association held a meeting at the hotel this morning might have had something to do with influencing the large attendance of that branch of the trade.

The convention was opened this morning by H. C. Clark of the Charlotte Supply Company, president of the dealers' association, who in a graceful address welcomed the delegates. The pleasant assembly hall was well filled, and the temperature was balmy but comfortable. Rev. V. W. Shields, Jacksonville, was introduced, and after a prayer "America" was sung.

Mayor W. S. Jordan, Jacksonville, welcomed the assemblage in behalf of the city, and in doing so took occasion to say that the machinery and supply business goes far toward making up the real values of the country. "Your product," he said, "does not depreciate, and everything you manufacture goes toward the material advancement of the country."

President Clark, in making his annual address, confined himself to asking the members to give special attention to the executive sessions of their respective organizations. John Trix of the American Injector Company, president of the manufacturers' association, made the address of the morning. Beginning with remarks of a general nature, he waxed properly serious. "This," said he, "is the age of organization, and we have a lot to do to maintain our claim that we are the workshop of the nation. We want you dealers to show how we can dispose of our product, and we must also learn how to produce cheaper." We make to-day in eight months more than we can consume in twelve, and we must find a market for it. We Americans make more than any other five nations put together; we make more than we can use in most lines of manufacture, and we must find an outlet for the product of the other four months." He called attention to the activity of the English and German machinery and supply men in South America and Mexico, which markets, he said, by right belong to us. In conclusion he asked the dealers to keep their eyes open to the opportunities offered to the South, and especially Florida, by the coming opening of the Panama Canal. With an address on the "Science of Business," by Elmer Crawford of the Allen-Crawford Publishing Company, Chicago, the morning session was brought to a close.

In the afternoon both organizations held separate executive sessions and appointed convention committees, while the ladies attending were taken by the Entertainment Committee on a trip to Atlantic Beach. To-night the members were guests at a smoker given by the Jacksonville Board of Trade.

Steel Corporation Wages and Earnings.

The following compilation of wages paid to United States Steel Corporation employees and of the net earnings of the corporation is made by the *Wall Street Journal*. It shows that in boom times earnings slightly exceed wages, while in depressions and in moderately active years wages considerably exceed earnings:

	Wages paid.	Number employees.	Aver. wage per man.	Net earnings.
1909.....	\$151,663,394	195,500	\$776	\$131,491,414
1908.....	120,570,829	185,211	729	91,847,710
1907.....	160,825,822	210,180	765	160,964,673
1906.....	147,765,540	202,457	729	150,024,273
1905.....	128,052,955	180,158	711	119,787,658
1904.....	99,778,276	147,343	677	73,176,522
1903.....	120,763,891	167,709	720	109,171,152
1902.....	120,528,343	168,127	717	133,308,764
	\$1,049,949,050			\$976,372,166

It will be noticed that the average annual wage per man was at high point last year, at \$776, as against \$717 in 1902 and \$711 in 1905.

The John A. Stewart Electric Company, electrical and steam machinery dealer, has removed its general offices from Fifth and Sycamore streets, the old location for the past 18 years, to suite 703, First National Bank Building, Cincinnati, Ohio. The company is erecting a concrete and steel warehouse and shops on the main line of the Pennsylvania Railroad and the Richmond Division of the same road at Red Bank station, Cincinnati, to provide for the handling, displacing and overhauling of the larger electrical and steam apparatus.

Manufacturers' and Dealers' Relations.*

Mutual Obligations Under Exclusive Agency Contracts.

BY CHARLES T. PAGE.

At the request of Secretary Mitchell I have the honor to present to this notable gathering a plain discussion of the following subject:

The responsibility of the agent to the manufacturer from whom he has accepted a contract or understanding to handle his line and whether it is considered fair on the part of the agent to sell other brands of manufactured goods than those contracted for, even if other contracts are in existence from nonmembers of the association.

The Spirit of Moral Obligation.

Judging from an experience covering a considerable number of years, I cannot believe this topic was assigned with the feeling that there is abroad generally a distrust and breach of faith in the relationship existing between dealer and manufacturer. My memory fails to recall a single instance where bad faith has developed in these mutual dealings. For this reason I shall not enter any discussion of hair splitting theories or fine-spun legal definitions.

The letter of the law has small place here, in comparison with the spirit of moral obligation. It is a comparatively easy matter to construct a theory which should control the relations which exist between manufacturer and agent. The satisfactory working of any such plan depends entirely on the mutual good faith of both parties to the contract. Granting that the dependence of the producer and the distributor on each other is a fact, and no one will refute that, it follows logically that if the proper point of view is maintained the result will be perforce mutually profitable. In short, the success of any arrangement between the factory and the dealer is in proportion to the good faith displayed by both. Therefore, in a brief way I shall first consider the duties of manufacturer to dealer and then the obligations of the dealer to the manufacturer.

The Manufacturer's Duty to His Dealer.

It goes without saying that the manufacturer who has a contract with a dealer should protect him throughout the territory assigned to him. This territory should be very carefully bounded and defined. It is often necessary or advisable to send salesmen direct from the factory to such assigned territory, but they should never go without the knowledge and consent of the dealer. It is clearly not only the duty of these salesmen to bend all their energy for the interest of their dealer, but they should also give all the credit due the dealer in their selling campaign through his territory. The factory can do a great deal toward stimulating trade and encouraging the dealer by the use of such judicious advertising as is acceptable to the dealer.

The factory cannot keep in too close personal touch with its dealers. From time to time the jobber should have the opportunity to examine at first hand the manufacture of the product he handles. This interchange of visits is productive of much more profit to the factory than mere increase of sales. The dealer becomes enthusiastic over his line; he gets new selling points that will make sales. In personal conferences misunderstandings fade and letters read with a different tone. As for prices, the factory should keep the dealer constantly posted by frequent bulletins. When any scaling down of prices takes place he should be apprised at the earliest possible moment in order to get every fair advantage by being first in the field. Another phase of this question of prices I shall touch on a little later after considering the obligations of the dealer to the manufacturer.

* Address before the joint convention of Southern Supply and Machinery Dealers' and American Supply and Machinery Manufacturers' associations, Jacksonville, Fla., April 6. Mr. Page is treasurer of the Page Belting Company, Concord, N. H.

The Dealer's Obligation to His Manufacturer.

Perhaps the most self-evident duty of the dealer is an absolute loyalty to the line he carries. He certainly should not sell any goods covered by his contract which are made by any other factory than the one with whom he is dealing. Take the question of consigned goods. It has sometimes been reported that a dealer carrying a consigned stock from a manufacturer would, on special occasions where competition was close, go outside and buy the goods, because in certain specific cases he could get an increased profit. This is manifestly a breach of moral sense. However, my faith in the integrity of the dealers is far too strong to permit any belief that this practice is general. Nevertheless, if such instances do exist, they are illustrations of a kind of bad faith which sooner or later will react on the dealer. Don't pay any attention to what some men say in a shameless bravado about honesty not being the best policy in the business world of to-day. For no unbusinesslike transaction can fail to produce results more or less disastrous to the guilty party. Cool and deliberate thought will only affirm this statement in the mind of any sensible man.

No man should sell goods for a manufacturer unless he can enter into the contract with enthusiasm and a firm resolve to look after the interests of the other party as well as his own. Promptness and a business sense are essential. He must be a live wire. His belief in the goods he sells and the men who make them must be unshaken. Let him once lose confidence and he had better quit the line or else get a personal conference with the sales manager. He cannot keep the factory too well informed as to his territory. Being the man on the spot he can study conditions, figure on futures, and even create markets for new commodities. All this is invaluable information for the manufacturer. There is an endless number of opportunities for him to study his lines and learn how to display them more effectively.

Friction Over Prices.

Probably no feature of the dealings between dealer and producer causes so much trouble as friction over prices. Too often the parties to the contract are at odds over prices, with the result that they lose sight of all that is to their mutual advantage. The dealer should help to maintain the prices which the manufacturer places on his goods, for generally speaking there is greater harmony with better satisfaction on all sides when prices are substantially uniform. To my mind a very important aid to securing such uniformity is a close association with competing dealers in the same territory.

Nothing promotes better feeling, nothing so quickly disarms suspicion and creates a common bond than for the dealers to get together and talk prices over frankly and squarely. The resulting advantages to the manufacturer as well as the dealer are obvious. For the dealer's own advantage there must be hearty co-operation with the factory to secure and maintain prices which afford a good profit to both. It is evident in the long run that no one can afford to do business with a house which is not making a satisfactory profit in its business. Furthermore, as a rule, the consumer is willing to pay a reasonable price, provided he knows that he is getting the goods as cheaply as his neighbor can get them. Then rightly should one condemn the spirit which denies the manufacturer and the jobber a fair profit. A splendid example of this is seen in the colossal success of the so-called trusts which may be rightly attributed not so much to their extortion policies as to their sane methods of merchandising. For each one is trying to get as much or a little more than his competitor.

The Efficiency of Associations.

Right here is shown the efficiency of such associations as the one in session to-day. It is in their power to protect, remedy evils, better conditions and pass

judgment on breaches of contract. If a manufacturer is guilty of bad faith in contracts he makes with a dealer, it is my belief that the members of the Supply Dealers' Association, after rigid investigation into the details warrants it, are justified in giving reasonable publicity to the fact so that discrimination may be made against such manufacturer. On the other hand, if a dealer does not act in perfect good faith, it seems only right that it should be one of the proper fields of effort for this association to inform its members. Do not forget that, in such cases, there should be indisputable evidence of breach of contract in order that no injustice may be done to the interested party. I have no doubt that the officials of the various associations may be implicitly relied on to make known to the members in a discreet way any and all cases of the violation of rights under contracts.

One of the happy results of such organizations as we represent is the increased confidence in the honesty and good faith of business men. Association with men inevitably tends to inspire confidence. My faith in the integrity of business men is too great to permit me to believe that their acts will often be the subject of just criticism.

The Metal Trades Convention Programme.

Following are the principal features of the programme of the twelfth annual convention of the National Metal Trades Association, to be held in the Hotel Astor, New York City, Wednesday and Thursday, April 13 and 14:

Wednesday Morning Session.

Address of welcome by John P. Mitchel, president Board of Aldermen, New York City.

Appointment of Convention Committees on Credentials, Resolutions, Constitution, Auditing and Convention.

Reports of Officers: Howard P. Eells, president; William Lodge, treasurer, and Robert Wuest, commissioner.

Afternoon Session.

Reports of Standing Committees: (a) Finance; (b) Joint Committee of the National Metal Trades Association and National Founders' Association; (c) Industrial Education; (d) Legislation; (e) Apprenticeship.

New business.

Evening Session.

Convention banquet, Hotel Astor.

Thursday Morning Session.

"The Old Age Pension Problem and Its Relation to the Industries," by M. W. Alexander, chairman Massachusetts Commission on Old Age Pensions, Lynn, Mass.

"The Compensation of Workmen" (illustrated), by H. L. Gantt, New York City.

"The Premium System," some of the drawbacks as usually applied and suggestions for minimizing them, by Carl G. Barth, Philadelphia, Pa.

"Employers' Liability Insurance," by Miles Dawson, New York City.

Afternoon Session.

"Modern Method of Shop Management" (illustrated), by Frederick A. Waldron, New York City, consulting engineer Ross Rifle Company, Quebec, Canada.

"Cincinnati's Continuation School," the school that affords the uneducated apprentice an opportunity, by Dr. Frank B. Dyer, Superintendent of Schools, Cincinnati.

"The Necessity for Continuation Schools to Develop Higher Intelligence" (illustrated lecture of the work of the school), by J. Howard Renshaw, instructor Continuation School, Cincinnati.

"The Manufacturer's Point of View," by Fred A. Geier, Cincinnati Milling Machine Company.

"The Advantage to the Employers and Their Apprentices," by William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati.

"The Originator of the School," by B. B. Quillen, Cincinnati Planer Company.

"The Growth of the Co-operative System," by Prof. Herman Schneider, University of Cincinnati.

"Insurance Against Unemployment," experimental British plan to be presented to Parliament, by John L. Griffiths, American Consul-General, London.

Report of convention committees.

Election of officers.

A Waterproof Wrapping and Case Lining.—The Angier Mills, 32 Front street, New York, is offering

a material named Keepdry for covering machinery, tools, implements and all things rustable in shipments by rail or boat. For flat car shipments it is claimed to be superior to oilcloth or enameled cloth, because it is waterproof, does not crack or chip off and costs but one-third as much. It is used in preference to tarpaulin, as it saves the bother of return charges. For wrapping goods, lining cases and covering crates it presents special advantages. It can be cut into strips for winding around awkward shapes, such as tires, coils, shafts, &c. Keepdry is reinforced with canvas to give toughness and strength. It is described by the manufacturer as "damp-proof, gas-proof, grease-proof and smell-proof." It comes in rolls of 100 yards, 36 and 40 in. wide, of different weights and strengths.

The Alan Wood-Hecksher Consolidation.

The report that the Richard Hecksher & Sons Company, manufacturer of pig iron, and the Alan Wood Iron & Steel Company, manufacturer of finished steel and iron, are to effect a consolidation has been substantially confirmed. The plant of the Alan Wood Iron & Steel Company is situated on the west bank of the Schuylkill River at Ivy Rock, near Conshohocken, Pa. On the opposite bank of the river, at Swedeland, Pa., is the plant of the Richard Hecksher & Sons Company. The two companies have entered into an agreement whereby they work co-operatively. This agreement is to be succeeded later by a combination of the two plants. For the present, each corporation will retain its identity. One of the chief objects of the merger is economy. The steel company buys considerable cold pig iron from the pig iron company. To save time, labor and fuel in transportation and remelting, the two plants will be connected by a steel bridge, over which the metal may be carried from the furnaces at Swedeland to the open hearth steel furnaces at Ivy Rock, in a molten state.

In addition to the erection of the bridge, it is proposed to increase the capacity of both plants by the erection of an additional blast furnace at Swedeland and the further extension of the steel plant at Ivy Rock, while other improvements will be made to reduce the cost of operation. No definite arrangements in this connection, however, have been completed. At present the capacity of the Hecksher plant is about 250,000 net tons of pig iron per annum, and of the Wood plant about 250,000 net tons of steel per annum. The combined capital of the two companies will be, in round figures, \$7,000,000, which will ultimately be increased to \$10,000,000.

The general offices of the Alan Wood Iron & Steel Company are at 519 Arch street, Philadelphia. The Richard Hecksher & Sons Company has offices in the Manhattan Building, Fourth and Walnut streets, Philadelphia.

A New Abendroth & Root Agency.—The B. M. Osburn Company, with offices in the Commercial Bank Building, Chicago, Ill., has been appointed by the Abendroth & Root Mfg. Company, Newburgh, N. Y., as sales representative for Chicago territory for Root spiral riveted pipe and Root water tube boilers. These products have been on the market for over 40 years and are in service in nearly all parts of the world. Some recent installations in prominent buildings are the exhaust steam lines for the new Singer Building and for the City Investing Building, in New York City. Large quantities of Root pipe in various sizes were used for the compressed air lines during the constructions of the tunnels under the Hudson and East rivers, also for water pipe for the new filtration plant known as the Torresdale system for the city of Philadelphia. Both boilers and large quantities of the spiral riveted pipe are in service in the construction of the Panama Canal.

OBITUARY.

HENRY H. PORTER.

Henry H. Porter, one of the leading citizens of Chicago, and for many years identified with its great manufacturing interests, died March 31, aged 75 years. He was born at Machias, Me., and went to Chicago in 1853. He secured employment as a clerk in the office of the Galena & Chicago Union Railway, now a part of the Northwestern system. In 1862 he became general superintendent of the Michigan Southern & Northern Indiana Railroad, now a part of the Lake Shore & Michigan Southern. In 1868 he was elected a director of the Chicago & Rock Island, continuing to serve until 1898. In 1870 he became a director in the Chicago & Northwestern and was identified with the group of financiers who built the Chicago, St. Paul, Minneapolis & Omaha.

In 1885 Mr. Porter purchased the plant of the Union Steel Company at Chicago, now the Union Works of the Illinois Steel Company. Four years later he, in co-operation with other leading financiers, was interested in the consolidation of this company with the Joliet Steel Company and the North Chicago Rolling Mill Company in the Illinois Steel Company, and was elected a director of the enlarged company, a position which he held until 1896. During that time he was actively interested in the building of the Duluth & Iron Range Railroad, which provided shipping facilities for the Vermillion Range in Minnesota. He was actively interested in the Chicago Shipbuilding Company and other large Western enterprises.

W. W. CHURCHILL died at Oshkosh, Wis., March 24, aged 43 years. He was born at Monroe, Wis., was graduated from Cornell University in 1889, took his master's degree in mechanical engineering in 1890, and immediately afterward engaged with Westinghouse, Church, Kerr & Co. He started with this firm in its mechanical stoker shop at Chicago and rose through various positions until he became vice-president and director, retiring from business in 1906 because of ill-health. During his active career he was in charge of a large number of important engineering undertakings. He leaves a widow and one son.

JOSEPH BRISCOE, Detroit, Mich., died March 24, aged 72 years. He was born in Philadelphia but had resided in Detroit almost his entire life. He was one of the founders of the Michigan Bolt & Nut Works, which was established to use machines of his invention. In the later years of his life he was engaged in other business. He leaves a widow and two sons. One of his sons is Benjamin Briscoe, president of the Maxwell-Briscoe Motor Company, and the other is Frank Briscoe, president of the Briscoe Mfg. Company and the Brush Runabout Company.

W. D. FORD, sales agent for the Wilmington Malleable Iron Company, Wilmington, Del., died March 22, aged 42 years. He leaves a widow and two children.

W. W. WALLACE, Canton, Ohio, for many years advertising manager of the Berger Mfg. Company, died March 29.

CHARLES NELSON, for more than 40 years a manufacturer of valves and fittings in New York City, died March 30 at Nyack, N. Y. Born in Dutchess County, he came to New York City in early manhood and entered the employ of the Novelty Iron Works. He became the head of the drafting room, and supervised the construction of the engines for the ships of the Pacific Mail Line and the warships built by the late William H. Webb for the Russian and United States governments. During the Civil War he supervised the construction of warships at Newburgh for the United States Government. He leaves a widow and a daughter.

SAMUEL M. GUSS, Reading, Pa., died March 28, aged 70 years. He was born in Chester County, Pennsylvania, learned the machinist's trade at Pottsville,

and became connected with rolling mill enterprises in the 60's. He took an active part in the erection of the Philadelphia & Reading Coal & Iron Company's mill in Reading, and had charge of its operation for 14 years. In 1895 he was placed in charge of the erection of the Oley street mill of the Reading Iron Company, of which he was made general foreman. He was one of the pioneers in the building of universal rolling mills, having supervised the erection of several plants of this character. He leaves a widow, four sons and three daughters.

THOMAS B. JEFFERY, Kenosha, Wis., died suddenly at Pompeii, Italy, April 2, aged 65 years. He was a mechanical engineer of great ability, was the inventor of the clincher pneumatic tire, and contributed largely to the development in this country of the bicycle and automobile industries. He was born in England, came to this country at the age of 18, located in Chicago, and for more than 25 years was one of the chief owners of the Gormully & Jeffery Mfg. Company, making bicycles. Selling out his interest in that company at a high price, he embarked in the manufacture of automobiles at Kenosha, becoming one of the American pioneers in that line and achieving marked success. He leaves a widow, two sons and two daughters. One of his sons, Charles T. Jeffery, has been general manager for several years of Thomas B. Jeffery & Co., Kenosha, and will continue in charge of the business.

GARDNER C. SIMS, Providence, R. I., president of the William A. Harris Steam Engine Company, and one of the inventors of the Armington & Sims engine, died March 19, aged 64 years. He was born at Niagara Falls. After serving an apprenticeship as a machinist he became a draftsman in the engineering department of the New York Navy Yard, and three years later was made superintendent of the J. C. Hoadley Engine Works, Lawrence, Mass. There he met Pardon Armington. A partnership was formed between them and they devoted themselves to the development of a quick running steam engine, a revolutionary idea. They built the first successful engine for Thomas A. Edison, and it was shown at the Paris Exposition of 1881. His active interest in steam engineering continued until his last illness. During the Spanish war he was of exceptional service to the Navy Department, being made a chief engineer and stationed at the Baston Navy Yard. It was he who fitted out the repair ship Vulcan. For this service he was commissioned lieutenant-commander. Later he was the superintending engineer of the United States transport service. He served as a Rhode Island commissioner to the Columbian Exposition, and he was chairman of the exposition committee on electricity, electrical and pneumatic appliances, and a member of the committee on machinery and transportation. He leaves a widow and a son.

HENRY C. FORREST, Philadelphia, died April 2, aged 54 years. As president of the Tacony Iron & Metal Company, he supervised the casting and erection of the gigantic statue of William Penn, which surmounts the tower of the Philadelphia City Hall.

JOSEPH R. HANSELL, long identified with the Hansell-Elcock Company, Chicago, died in that city March 31, aged 75 years. He had been engaged in the foundry business in Chicago for about 40 years and in 1888 became a member of the company named, embarking in architectural foundry work. In later years the fabrication and erection of steel construction were taken up and the company has been active in the erection of modern steel buildings in Chicago. Mr. Hansell retired from active business several years ago.

It is stated on very good authority that the purchaser of the Duncannon Iron Company's plant, Duncannon, Pa., at the recent receiver's sale, was Harry H. Light of Lebanon, Pa., and that the plant will be put in operation as soon as practicable.

PERSONAL.

Thomas H. Simpson, president of the Michigan Malleable Iron Company and vice-president of the Detroit Seamless Steel Tubes Company, Detroit, Mich., returned last week from a two months' Mediterranean voyage. Palestine was included in his itinerary.

L. J. Wing has resigned as president of the L. J. Wing Mfg. Company, 90 West street, New York City, and E. D. Fieux has been elected to fill the vacancy. C. E. Cole has been elected vice-president and H. S. Wheller remains as secretary. Mr. Wing still remains a director and stockholder of the company and will devote considerable time to its interests.

Frank McMurdie, superintendent of the American Blower Company's Detroit plants since about 1894, has resigned, his resignation taking effect March 31. After a short respite from business cares he will take the general superintendency of the Clarage Foundry & Mfg. Company of Kalamazoo, Mich. He was one of the oldest employees of the American Blower Company, having entered its employ in 1883.

George E. Howard has been appointed Eastern representative for J. R. Flannery & Co., general sales agents for the Tate flexible staybolt, manufactured by the Flannery Bolt Company, Pittsburgh, Pa.

Percy F. Hogan of Hogan & Son, New York, has resigned as vice-president and Eastern manager of the Union Sheet & Tin Plate Company, whose offices are in the Farmers' Bank Building, Pittsburgh. George I. Stanford has also resigned as general manager of the company.

R. D. Brooks, who has been associated for many years with subsidiary companies of the International Steam Pump Company, severed his connection with those interests April 1 to become general manager of the Bayonne Casting Company, Bayonne, N. J., manufacturer and dealer in Monel metal. His successor is A. H. Braidwood.

W. B. Edgar, purchasing agent of the International Harvester Company, Chicago, has recently made a tour of investigation among Southern blast furnaces, carrying out a policy adopted by that company to have its purchasing agents make trips from time to time through the iron, coal and coke regions from which its materials are obtained.

W. A. Green has been appointed manager of the Southern district of the Republic Iron & Steel Company, with headquarters at Birmingham, Ala. The position of treasurer and auditor, Southern district, has been abolished. Mr. Green will have full charge of all business of the company in the Southern district, and the local officials there will be responsible directly to him for the operations of their respective departments.

Gerhard Drouvé, founder and head of the G. Drouvé Company, Bridgeport, Conn., was tendered a banquet by business friends of Connecticut cities, at the Stratfield, Bridgeport, March 18, in honor of the twenty-fifth anniversary of the beginning of his business career. E. P. Bullard, Jr., president of the Bullard Machine Tool Company, was the toastmaster, and among others present was former Governor Rollin S. Woodruff of New Haven.

W. C. Wilcox has been appointed manager of the Reeves Pulley Company at Chicago, after having served the company in several subordinate positions since October, 1906. He succeeds E. O. Winterowd, resigned. The Chicago office and warerooms are at the northeast corner of Clinton and Monroe streets.

A. Tropenas, president of the Tropenas Steel Company, New Castle, Del., sailed March 23 for a business trip abroad.

At the recent annual meeting of Vickers, Sons & Maxim, at Sheffield, England, the resignation was ac-

cepted with regret of Col. T. E. Vickers, who had been managing director since the formation of the company in 1867 and chairman since 1873, and it was agreed as a mark of appreciation to pay him a pension of £6000 a year for life.

William Wibel has been appointed assistant purchasing agent of the National Railways of Mexico, with headquarters at 25 Broad street, New York City.

Henry D. Shute, formerly assistant to the second vice-president of the Westinghouse Electric & Mfg. Company, has been elected to succeed Walter M. McFarland, resigned. On the occasion of his retirement, Mr. McFarland was presented by his former associates with a handsome electrolier. J. B. Comstock, formerly of the Westinghouse Bureau of Publicity, who has also resigned, was presented with a Russia leather chair.

Andrew Carnegie arrived in Pittsburgh on the morning of April 1, and spent four days in that city, being the recipient of much social attention. On Friday evening he was tendered a banquet at the Duquesne Club by the Carnegie Veterans' Association. The toastmaster was Judge James H. Reed, the address of welcome was made by Henry P. Bope, vice-president of the Carnegie Steel Company, and John H. Unger of the Research Laboratory of the United States Steel Corporation spoke on "The Carnegie Steel Company—Past and Future." Mr. Carnegie responded in a very happy speech. He was tendered a dinner on Saturday evening at the Hotel Schenley by the Board of Trustees of the Carnegie Institute, and another dinner by the Pittsburgh Civic Commission. He visited the Carnegie Institute and the Carnegie Technical Schools, and expressed himself as highly pleased with the work being done by both of these institutions.

F. Alexander Chandler, secretary of the Chandler & Farquhar Company, Boston, Mass., sailed April 2 for a two-months' pleasure trip in Europe.

H. S. Matthews of the Graves-Matthews Brick Company, Birmingham, Ala., one of the city's largest and most progressive industries, has been elected vice-president of the Alabama Consolidated Coal & Iron Company, as well as a director in that company. It is understood that he will be in active charge of the company's affairs, with headquarters in its offices in the First National Bank Building. Guy R. Johnson, former vice-president and general manager, will occupy the position of general manager in charge of operations.

A. F. Huston, president of the Lukens Iron & Steel Company, Coatesville, Pa., returned last week from a three months' vacation in Florida.

S. H. Guisler, for 27 years with the National Tube Company, and located recently at Lorain, Ohio, part of the time foreman of No. 3 lap mill, has been appointed superintendent of the Republic Iron & Steel Company's new tube mill.

The Phoenix Warehouse Company, Phoenix, Ariz., has been incorporated to engage in business as a wholesale dealer in corrugated iron, wire fencing, nails, rope and general heavy hardware, wholesaling only. The company will represent manufacturers and jobbers who do not care to send out their own salesmen, or when houses wish to ship part of carloads of any commodity, will take the remainder on consignment. H. P. de Mund is president and H. K. Behn is secretary and treasurer. The main office and warehouse are located at Jackson street and Third avenue. The company has joined the American Warehouse Men's Association.

The Alabama City, Ala., blast furnace of the Southern Iron & Steel Company, which blew in in February, did good work last month. On March 20 it produced 332 tons of pig iron. Four open hearth furnaces are now being operated at the connected steel plant.

Pig Iron Production.

Slightly Decreased Rate in March.

Active Capacity April 1 Practically the Same as on March 1.

In March, a 31-day month, the country's production of coke and anthracite pig iron was 2,615,261 gross tons, or 84,363 tons a day, as against 2,397,254 tons in February, or 85,616 tons a day. The decline in the daily rate was thus 1253 tons. This was due to a falling off in the output of steel works furnaces from 57,876 tons a day in February to 56,104 tons. The merchant furnaces, on the other hand, increased their production from 27,740 tons a day in February to 28,259 tons in March. New York and Alabama show the largest increase in daily output. On April 1 313 furnaces, with a daily capacity of 84,610 tons, were in blast, against 311 furnaces, with a daily capacity of 84,854 tons on March 1. Production is thus practically stationary, with no indications of a change in either direction.

Daily Rate of Production.

The daily rate of production of coke and anthracite pig iron by months, beginning with March, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.			
	Steel works.	Merchant.	Total.
March, 1909.....	36,811	22,421	59,232
April	36,436	21,526	57,962
May	40,531	20,222	60,753
June	45,507	19,149	64,656
July	48,670	19,123	67,793
August	51,354	21,192	72,546
September	55,361	24,146	79,507
October	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910.....	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,104	28,259	84,363

Capacity in Blast April 1 and March 1.

The following table shows the daily capacity of furnaces in blast April 1 and March 1. For the sake of uniformity, we have adopted the daily rate rather than the weekly rate for this comparison, since our production records are now on the per diem basis:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	April 1.		March 1.	
		Number in blast.	Capacity per day.	Number in blast.	Capacity per day.
New York:					
Buffalo.....	16	16	5,296	16	5,122
Other New York...	7	3	502	3	623
New Jersey.....	8	5	953	5	932
Spiegel.....	2	0	0	0	0
Pennsylvania:					
Lehigh Valley.....	23	14	1,645	14	1,774
Spiegel.....	3	3	165	3	128
Schuylkill Valley...	15	9	1,940	9	1,852
Low. Susquehanna...	7	6	1,118	7	1,194
Lebanon Valley.....	10	9	1,125	9	1,090
Pittsburgh dist....	49	46	18,652	46	19,272
Spiegel.....	3	3	461	3	415
Shenango Valley....	20	15	4,194	16	4,622
West. Penn.....	27	21	4,926	19	4,611
Maryland.....	4	3	894	3	936
Wheeling dist.....	14	11	3,530	11	3,772
Ohio:					
Mahoning Valley....	22	20	7,532	21	7,607
Cent. and Northern...	21	20	7,053	20	7,195
Hocking Val., Hanging Rock and S. W. Ohio.....	15	12	1,547	12	1,520
Illinois and Indiana...	32	29	11,434	27	10,875
Spiegel.....	2	2	202	2	232
Michigan, Wisconsin and Minnesota.....	9	7	1,275	8	1,322
Colorado, Missouri and Washington.....	7	5	1,214	5	1,303
The South:					
Virginia.....	23	13	1,452	12	1,245
Kentucky.....	5	2	295	1	202
Alabama.....	46	25	5,808	25	5,512
Tenn. and Georgia...	20	14	1,397	14	1,498
Totals.....	410	313	84,610	311	84,854

Among furnaces blown in in March are one Lock Ridge in the Lehigh Valley, one Brooke in the Schuylkill Valley, Fannie in the Shenango Valley, one Cam-

bria and one Saxton in western Pennsylvania, West End in Virginia, Ashland No. 2 in Kentucky and one Joliet in Illinois.

The list of furnaces blown out in the month includes one Hokendaqua in the Lehigh Valley, Topton in the Schuylkill Valley, one Paxton (banked) in the Susquehanna Valley, Atlantic and one South Sharon in the Shenango Valley, one La Belle in the Wheeling district, one Hubbard in the Mahoning Valley and Spring Valley in Wisconsin.

March Output by Districts.

The table below gives the production of all coke and anthracite furnaces in March and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	Nov. (30 days)	Dec. (31 days)	Jan. (31 days)	Feb. (28 days)	Mar. (31 days)
New York.....	178,783	166,725	172,260	156,470	179,728
New Jersey.....	36,444	35,711	28,856	26,102	29,557
Lehigh Valley.....	66,703	65,951	62,601	54,028	52,224
Schuylkill Val.	56,463	57,585	60,624	53,996	62,865
Lower Susquehanna and Lebanon Val.	71,463	75,737	69,413	64,054	70,738
Pittsburgh dis.	573,439	617,952	603,261	541,791	592,494
Shenango Val.	157,984	157,901	159,418	137,095	137,315
West. Penn.....	139,168	146,732	141,495	133,266	143,308
Md., Va. and Kentucky.....	75,661	75,450	72,425	66,654	78,761
Wheeling dis.	135,274	139,496	124,556	120,036	113,753
Mahoning Val.	232,230	233,147	232,381	220,779	240,094
Central and North. Ohio.....	208,559	217,217	217,681	201,462	218,660
Hocking Valley, Hanging Rock and S.W. Ohio	42,735	48,163	49,658	42,876	47,935
Mich., Minn., Mo., Wis., Colo.....	62,088	67,626	70,989	65,363	77,029
Chicago dis.....	284,725	314,634	333,892	322,196	348,972
Alabama.....	184,291	177,568	170,143	154,337	180,035
Tennessee, Georgia and Texas.....	41,498	38,085	38,952	36,949	41,793
Totals.....	2,547,508	2,635,680	2,608,605	2,397,254	2,615,261

Production of Steel Companies.

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.			Spiegeleisen and ferromanganese.	
	1908.	1909.	1910.	1909.	1910.
January.....	664,415	1,117,823	1,773,201	12,325	19,538
February.....	745,802	1,073,363	1,620,539	10,046	11,396
March.....	841,502	1,140,553	1,739,212	23,743	25,591
April.....	725,548	1,093,092	.....	22,478	.....
May.....	759,674	1,256,448	.....	20,834	.....
June.....	717,689	1,365,527	.....	16,516	.....
July.....	798,639	1,508,762	.....	17,613	.....
August.....	897,052	1,591,991	.....	22,313	.....
September.....	933,514	1,660,839	.....	28,148	.....
October.....	996,481	1,769,094	.....	25,384	.....
November.....	981,167	1,689,994	.....	23,376	.....
December.....	1,090,339	1,768,799	.....	20,791	.....

The Curves of Pig Iron Production and Prices.

The curve of pig iron production from January, 1907, to the present time is shown in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.

	—Gross Tons.			
	1907.	1908.	1909.	1910.
January.....	71,149	33,718	57,975	84,148
February.....	73,038	37,163	60,976	85,616
March.....	71,821	39,619	59,232	84,363
April.....	73,885	38,289	57,962	.....
May.....	74,048	37,603	60,753	.....
June.....	74,486	36,444	64,656	.....
July.....	72,763	39,287	67,793	.....
August.....	72,594	43,851	72,546	.....
September.....	72,783	47,300	79,507	.....
October.....	75,386	50,554	83,856	.....
November.....	60,937	52,595	84,917	.....
December.....	39,815	56,158	85,022	.....

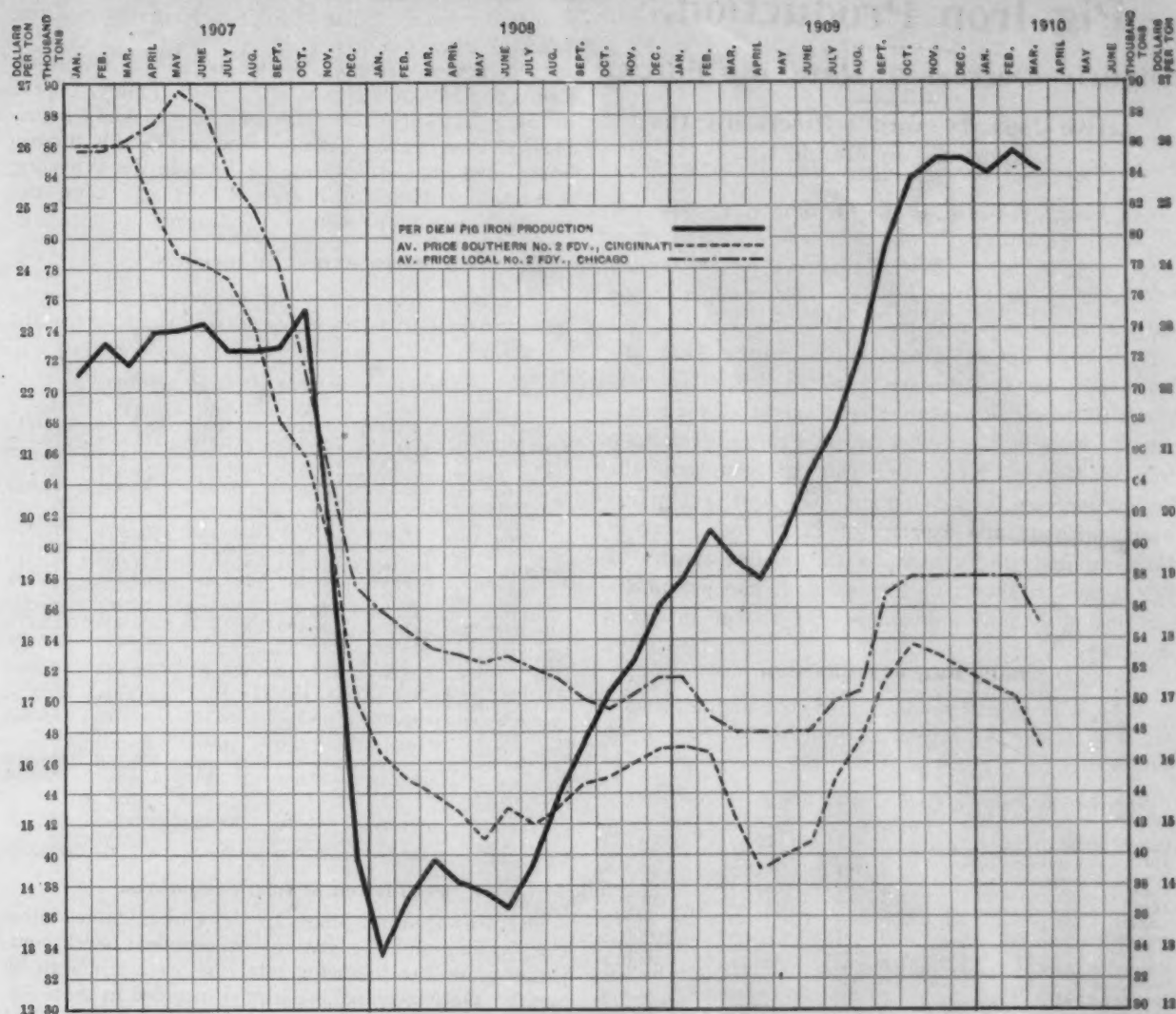


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to April 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago.

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou.	Loc.	Sou.	Loc.	Sou.	Loc.	Sou.	Loc.
	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2	No. 2
	Cin.	Chi.	Cin.	Chi.	Cin.	Chi.	Cin.	Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.80	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	.....	.....
May	24.25	26.85	14.75	17.63	14.50	16.50	.....	.....
June	24.10	26.60	15.25	17.73	14.70	16.50	.....	.....
July	23.85	25.55	15.00	17.55	15.75	17.00	.....	.....
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	.....	.....
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	.....	.....
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	.....	.....
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	.....	.....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	.....	.....

The Record of Production By Months.

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,615,261
April	2,216,558	1,149,602	1,738,877	.....
May	2,295,505	1,165,688	1,883,330	.....
June	2,234,575	1,092,131	1,930,866	.....
July	2,255,600	1,218,129	2,103,431	.....
August	2,250,410	1,359,831	2,248,930	.....
September	2,183,487	1,418,998	2,385,206	.....
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fulton Building, Pittsburgh, on the evening of April 4. A. C. Eastwood, president of the Electric Controller & Mfg. Company, Cleveland, Ohio, presented a paper entitled "Lifting Magnets as Applied to Foundry Work," and A. W. Moyer of the J. W. Paxson Company, Philadelphia, presented a paper entitled "Foundry Mono Rail Systems."

Customs Decisions.

Flexible Copper Alloy Tubing.

The Board of United States General Appraisers has refused to reverse the action of the collector of customs at New York in his assessment of a 45 per cent. duty on merchandise returned by the appraiser as "flexible copper alloy tubing, copper being the component material of chief value." Hensel, Bruckmann & Lorbacher, the importers, set up the contention that the articles should be assessed at specific rates, either under paragraph 176, as copper pipes, or under paragraph 152, as iron or steel tubes. Upon the hearing of the case the proof not only related to the copper alloy tubing, but was extended also so as to include certain flexible tubing made of steel and galvanized iron. The importers requested an analysis of the samples in evidence, with the result that the report of the chemist showed that the so-called tubing is in fact a tubing composed of phosphor bronze.

The United States Aluminum Company, a subsidiary of the Aluminum Company of America, is now operating under lease the plant of the Lackawanna Foundries at Dover, N. J., manufacturing aluminum bronze powder. This is stated to be a new industry in this country.

The Pittsburgh Tool Steel Wire Company, Monaca, Pa., manufacturer of Monaca cold drawn tool steel, drill rods, &c., is building a brick addition, 40 x 50 ft., to its plant, which will increase its annealing and pickling capacity. The company is busy on contracts from machine shops, automobile builders and railroads.

THE IRON AND METAL MARKETS

Pig Iron Production Stationary.

A Record in Steel Ingot Output in March.

Wage Advances in the Iron Industry.

In view of the large number of wage advances to railroad workers, it is to be expected that iron and steel manufacturers will consider the propriety of similar action. The Steel Corporation has been referred to as about to make an announcement, but it has not definitely taken up the matter, nor have other steel companies. However, the recent advances in Lake Superior iron miners' wages are considered as forerunners of others at furnaces and mills.

To the blast furnaces the problem of increased labor cost, in connection with higher priced ores soon to come forward, is not an easy one, with the present forbidding outlook for pig iron. The blowing out of furnaces is being discussed as an alternative that may soon have to be faced. The only report of a furnace planning to go out because of low prices comes from Cleveland, and that stack is offset by a new one soon to be started up in the same district.

The production of coke and anthracite pig iron in March was 2,615,261 gross tons, or 84,363 tons a day, as against 2,397,254 tons in February, or 85,616 tons a day—a decline in the daily rate of 1253 tons. This was due to a falling off in the output of steel works furnaces from 57,876 tons a day in February to 56,104 tons, the merchant furnaces increasing their production from 27,740 tons a day in February to 28,259 tons in March. On April 1, 313 furnaces with a daily capacity of 84,610 tons were in blast, against 311 furnaces with a daily capacity of 84,854 tons on March 1.

The United States Steel Corporation produced 1,206,000 gross tons of pig iron in March, or close to its best record. In steel ingots March was its record month, with a total of 1,491,000 gross tons, against 1,409,000, the best previous total, made in October, 1909.

The pig iron markets have grown quieter. In the Central West a sale of 25,000 tons of basic iron was made for delivery in the last half of the year, and a large car interest is reported to have taken 20,000 tons of malleable and foundry iron. But buyers generally are simply looking on, apparently with no fear of outstaying their market. Cash sales of Southern No. 2 have been made at \$12, Birmingham, and furnace iron is more freely offered at \$12.50 for the balance of the year.

Further sales of basic iron have been made in eastern Pennsylvania, including 10,000 tons for third quarter at somewhat less than \$17.75, delivered. Virginia basic is reported to have been offered at \$17.50 for this delivery.

A western Pennsylvania steel company has taken 3000 tons of Bessemer iron for early delivery at \$17.50, at Valley furnace. Basic iron is still available at \$16, at furnace.

In the Pittsburgh district a number of resales of Bessemer billets and sheet bars have been made by consumers below mill prices. These concessions are not obtainable, however, in the case of open hearth steel.

The markets for finished material show some irregularity, due to the increasing capacity now available in certain lines. Yet the March bookings of new orders by important steel companies were considerably larger than those of February. Record shipments of about 1,060,000 tons of finished products made by the Steel Corporation last month, while they represent water that has passed the mill, are yet significant in view of all the factors that have been regarded as deterrent.

All the large sellers of bars have taken some part of the contracts recently placed by implement manufacturers, though much of this business for 1911 delivery is yet to be placed.

Structural steel orders taken by the leading interest in the first quarter of 1910 were larger than in any similar period, excepting the first quarters of 1906 and 1907. A good many railroads are about to place bridge work. In the Central West 15,000 to 20,000 tons of such construction is about to be placed.

Car orders fell off last week, but the early letting of large contracts by the New York Central and the Harriman lines is expected.

Much has been made of the closing down of the tube mills at Lorain as an indication of the state of trade in that product. A scarcity of the gas coal required for welding operations will be remedied this week, and the plant will resume operations Monday. It is understood that the movement of pipe, which was very slow in the winter months, shows much improvement.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 6, 1910.	Mar. 30, 1910.	Mar. 2, 1910.	Apr. 7, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	\$18.00	\$18.00	\$18.00	\$16.25
Foundry No. 2, Southern, Cincinnati	15.75	15.75	16.75	14.25
Foundry No. 2, local, Chicago ..	18.00	18.00	18.50	16.50
Basic, delivered, eastern Penn. .	17.75	17.75	18.50	15.00
Basic, Valley furnace	16.00	16.00	16.00	14.25
Bessemer, Pittsburgh	18.40	18.40	18.90	15.90
Gray forge, Pittsburgh	16.15	16.15	16.15	14.40
Lake Superior charcoal, Chicago	19.00	19.00	19.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh ..	27.00	27.50	27.50	23.00
Forging billets, Pittsburgh	32.00	32.00	32.00	25.00
Open hearth billets, Philadelphia	30.60	30.60	30.60	25.40
Wire rods, Pittsburgh	33.00	33.00	33.00	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Bessemer melting, Chicago	17.00	17.00	16.50	13.00
Steel rails, melting, Philadelphia	16.50	16.50	16.50	13.25
Iron rails, Chicago	18.50	19.00	19.00	15.75
Iron rails, Philadelphia	20.50	20.50	20.00	17.00
Car wheels, Chicago	17.00	17.00	17.00	14.50
Car wheels, Philadelphia	16.75	16.75	16.75	14.00
Heavy steel scrap, Pittsburgh ..	17.00	17.00	16.50	14.00
Heavy steel scrap, Chicago	14.75	15.00	15.00	12.25
Heavy steel scrap, Philadelphia.	16.50	16.50	16.50	13.25
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia ..	1.55	1.55	1.60	1.37
Common iron bars, Chicago	1.55	1.55	1.55	1.32½
Common iron bars, Pittsburgh ..	1.65	1.65	1.65	1.30
Steel bars, tidewater, New York	1.61	1.61	1.61	1.36
Steel bars, Pittsburgh	1.45	1.45	1.45	1.20
Tank plates, tidewater, New York	1.71	1.71	1.71	1.46
Tank plates, Pittsburgh	1.55	1.55	1.55	1.30
Beams, tidewater, New York	1.66	1.66	1.66	1.46
Beams, Pittsburgh	1.50	1.50	1.50	1.30
Angles, tidewater, New York	1.66	1.66	1.66	1.46
Angles, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, grooved steel, Pittsburgh.	1.50	1.50	1.50	1.25
Skelp, sheared steel, Pittsburgh.	1.60	1.60	1.60	1.35
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.40	2.40	2.40	2.20
Wire nails, Pittsburgh	1.85	1.85	1.85	1.95
Cut nails, Pittsburgh	1.85	1.85	1.85	1.80
Barb wire, galv., Pittsburgh	2.15	2.15	2.15	2.40
METALS, Per Pound:				
Lake copper, New York	13.75	13.75	13.75	13.00
Electrolytic copper, New York ..	13.25	13.25	13.37½	12.50
Spelter, New York	5.60	5.65	5.75	4.82½
Spelter, St. Louis	5.45	5.50	5.60	4.67½
Lead, New York	4.40	4.40	4.65	4.12½
Lead, St. Louis	4.25	4.25	4.50	4.00
Tin, New York	32.90	33.25	32.87½	29.25
Antimony, Hallett, New York ..	8.25	8.25	8.25	7.75
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York ..	\$3.84	\$3.84	\$3.84	\$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c. to 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c. net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; tees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.55c. to 1.60c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16 in. on thinnest edge.....	\$0.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Stirr bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, \$1.70 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe which went into effect January 1:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
½ and ¾ in.....	70	54	65	52
¾ in.....	71	57	66	52
1 in.....	74	62	69	57
¾ to 6 in.....	78	68	73	63
7 to 12 in.....	72	57	67	52
Plugged and Reamed.				
1 to 4 in.....	76	66	71	61
Extra Strong, Plain Ends.				
¾ to ¾ in.....	63	51	58	46
1 to 4 in.....	70	58	65	53
¾ to 5 in.....	66	54	61	49
9, 10, 11 and 12 in.....	54	42	..	..
Double Extra Strong, Plain Ends.				
¾ to 8 in.....	59	48	54	43

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.....	40	43
1½ to 2½ in.....	61	43
2½ in.....	63	48
2½ to 5 in.....	69	55
6 to 13 in.....	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2½ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$33.

Steel Rivets.—Structural rivets, ¾ in. and larger, 2.15c., base; cone head boiler rivets, ¾ in. and larger, 2.25c., base; ¾ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of \$2 to \$3 a ton to the small trade.

Pittsburgh.

PARK BUILDING, April 6, 1910.—(By Telegraph.)

Pig Iron.—There is possibly a little more inquiry for pig iron, confined to small lots and for this and next month's shipment. A local interest has bought upward of 3000 tons of No. 2 foundry iron for April and May delivery at a price reported a shade under \$15.75, Valley furnace. A dealer reports a sale of 3000 tons of Bessemer iron, delivery at the rate of 1000 tons a month in April, May and June at \$17.50, Valley furnace. A sale is also reported of 500 tons of forge iron at about \$16.15, Pittsburgh, equal to \$15.25, Valley furnace. It is stated that a Cleveland interest is in the market for 5000 tons of basic for second quarter delivery, but this is not confirmed here. We quote Bessemer iron at \$17.50; basic, \$16 to \$16.25; malleable Bessemer, \$16; No. 2 foundry, \$15.75 to \$16, and gray forge, \$15.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Steel.—The supply of Bessemer steel in the shape of billets and sheet and tin bars is more plentiful and prices are lower. Resales of Bessemer billets are reported in small lots at \$27 to \$27.50, and sheet bars at \$28 to \$28.50. New demand seems to be almost entirely for open hearth steel, which is still scarce, and brings high prices. We quote Bessemer 4 x 4-in. billets at \$27 to \$27.50; Bessemer sheet and tin bars, \$28 to \$28.50; 4 x 4-in. open hearth billets, \$29 to \$29.50; open hearth small billets, \$30.50 to \$31; open hearth sheet and tin bars, \$29.50 to \$30, and forging billets, \$32 to \$33, Pittsburgh.

(By Mail.)

As yet the strike of the bituminous coal miners has not interfered with operations of any of the manufacturing plants in the Pittsburgh district, most of them having enough coal on hand to run two or three weeks, while some are stocked for a longer period. It is not believed that the strike will last long, as the differences between the miners and the operators are not regarded as very serious. The local steel trade, generally speaking, is quiet. The few actual sales of Bessemer iron made during March show the average price to have been \$17.58, at Valley furnace, while the average price of basic iron during March is given at \$16, Valley furnace. The actual market to-day on Bessemer pig iron is \$17.50, at Valley furnace, but it is possible that on a firm offer this price could be shaded. Basic iron is quite firm at \$16, at Valley furnace. As to the reported sale of 3000 tons at \$16.50, Valley furnace, it is stated that this sale was made by a dealer to a local consumer in order to adjust some contracts, and the price is regarded as a compromise by both the buyer and the seller. The offerings of steel for resale seem to be larger, especially in Bessemer billets and sheet and tin bars, and these sales are made at prices that in a good many cases are much lower than the mills will name. Finished iron and steel entering into building operations is showing an improvement in demand, notably in sheets, the demand for which in the latter part of March showed quite a heavy increase over the first half of the month. The two quiet items in finished material seem to be structural shapes and pipe, stocks of the latter carried by mills and jobbers being very heavy and not moving out freely. The coke trade is dull and neglected. The scrap trade is easier.

Ferromanganese.—No sales of moment have been made and prices have shown a decline. We quote 80 per cent. foreign at \$41.50, Baltimore, the freight rate to Pittsburgh since April 1 being \$1.95 a ton. It is probable that on a firm offer and for any large tonnage \$41, Baltimore, could be done.

Ferrosilicon.—The demand is light, consumers being pretty well covered for a long period ahead. We quote 10 per cent. at \$23.90; 11 per cent., \$24.90; 12 per cent., \$25.90, and 50 per cent. at \$62, Pittsburgh, for forward shipment.

Muck Bar.—No inquiries have come out the past week.

We continue to quote best grades of muck bar, made from all pig iron, at \$29 to \$29.50, Pittsburgh.

Rods.—On small lots of rods for early delivery \$33, Pittsburgh, continues to be quoted for both Bessemer and open hearth, but if an inquiry came in the market covering desirable tonnage there is no doubt that this price could be shaded.

Skelp.—The quietness in the pipe trade is reflected in skelp, the demand for which for several weeks has been rather quiet, and prices are only fairly strong. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—The tonnage in standard sections actually booked by the Carnegie Steel Company in March was the heaviest in any one month for a long time. While there were no very large contracts placed last month, the aggregate of orders, ranging from 100 tons up to 1000 tons or more, made up a very fair business. In light rails, the Carnegie Steel Company entered actual new orders last week for about 5500 tons, the heaviest week in some months. The company has secured in the last several months some excellent orders for standard section rails for export, a good part of its March business being export rails, the contracts for which were secured by the United States Steel Products Export Company. The three Edgar Thomson rail mills are in operation with several months' work booked ahead, on the basis of present operations, about 50 per cent. of actual capacity. We quote steel axles at 1.75c. to 1.80c. and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

Plates.—Orders for steel cars last week were not as heavy as in the previous week. The Baltimore & Ohio Railroad has given an order to the American Locomotive Company for 95 locomotives, which will be built at its shops at Richmond, Va. The Chicago, Burlington & Quincy has ordered 1000 steel cars from the Pressed Steel Car Company, while the Chesapeake & Ohio has placed 1000 cars with the same concern, 500 with the Standard Steel Car Company and 1000 with the American Car & Foundry Company. The New York Central placed 3000 steel cars with the Merchants' Despatch, but later reduced this to 2000 cars, and gave 1000 cars to another car building concern. The leading steel car companies are pretty well filled up to July or later. The Pressed Steel Car Company is now specifying for upward of 1500 tons of plates and small shapes per day, and the Standard Steel Car Company for close to 1000 tons per day. Some competition for plate business is noted among several of the Eastern mills, and occasionally plates are sold by local mills on the basis of 1.52c., Pittsburgh, to meet this competition. We quote the general market on plates at 1.55c., Pittsburgh, for 1/4-in. and heavier.

Structural Material.—The situation seems to be somewhat quiet. Competition among the fabricating concerns is keen, and some recent jobs have been placed at relatively low prices. The American Bridge Company entered about 43,000 tons in March, against a capacity of 60,000 tons. The structural mills are now able to make fairly prompt deliveries on plain material, and could take care of more tonnage if they had it. We quote beams and channels up to 15-in. at 1.50c. for general current orders and 1.55c. for small orders, f.o.b. Pittsburgh.

Sheets.—In the last two weeks in March there was a decided increase in the demand for all kinds of sheets, due to the active resumption of outside building operations. The cutting in prices of black and galvanized sheets, which existed some time ago, has pretty well disappeared and prices are stronger than for some time. The American Sheet & Tin Plate Company is actively operating all its sheet mills except the Bridgeport plant, and its present output of sheet mill products is heavier than ever before in its history. Some contracts for sheets have recently been placed for delivery in third quarter, and indications are that the mills will be kept pretty busy for three or four months at least. We are advised that electrical and blue annealed sheets still command premiums of \$1 to \$2 a ton for prompt shipment.

Tin Plate.—The demand for tin plate continues active and some large contracts have been taken for delivery in third quarter. All the leading tin plate mills are pretty well filled up until next October. The American Sheet & Tin Plate Company has 70 hot tin mills in its three tin plate plants in the New Castle district and 68 of these mills are running. The company is operating a total of 186 hot tin mills out of 235 serviceable mills. Prices are very firm, and we quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh, for forward delivery.

Bars.—More orders are being placed for iron bars, notably by railroads, and more orders are also being received from other consumers. In steel bars some contracts have already been made with implement makers for last half of the year delivery, and much more is under negotiation. The steel bar makers are still far behind in deliveries, two of the local

mills stating that orders already on their books, with prospective business, will fill them up as far as October. The market is firm. We continue to quote steel bars at 1.45c. on orders for delivery ahead and 1.50c. for shipment within four to six weeks from date of order. We quote iron bars at 1.65c., Pittsburgh, with freight to destination added.

Hoops and Bands.—The demand for both hoops and bands is good, and the mills are entering more new orders than for some time. Specifications in March against contracts are reported to have been quite satisfactory. We continue to quote steel hoops for forward delivery at 1.50c. to 1.60c., while for prompt shipment as high as 1.65c. is obtainable. Steel bands are 1.40c. to 1.50c. on contracts for forward delivery and 1.60c. to 1.65c. for reasonably prompt shipment, these carrying steel bar card extras.

Spelter.—The market is dull and prices are weak. We quote prime grades of Western spelter at 5.40c., East St. Louis, equal to 5.52 1/2c., Pittsburgh.

Spikes.—More inquiries for spikes from the railroads are in the market now than for some time, and it is expected that some large orders will be placed in the near future. One railroad has contracted for 4000 kegs with a local mill. We quote standard sizes of railroad spikes, 4 1/2 x 9-16 in. and larger, at \$1.70 for Western shipment and \$1.75 for local trade. Boat spikes are firm at \$1.75, base, and small railroad spikes at \$1.75, base. These prices are for carload and larger lots.

Shafting.—The demand for shafting continues quite active, while specifications against contracts are heavy, the shipments in March showing a large increase over the previous month. It is stated that discounts are being absolutely maintained at 55 per cent. off in carloads and 55 per cent. off in less than carloads, delivered in base territory.

Rivets.—The makers are entering more new orders than for some time, the demand for rivets having increased materially in the last week or 10 days. Specifications against old contracts are also reported as coming in quite freely. We are advised that prices printed elsewhere in this issue are being maintained.

Wire Products.—The favorable weather is having a perceptible effect in increasing the demand for wire products, the mills entering more new orders for wire nails and wire in the past week or two than for some time. The jobbers are also specifying more freely against their old contracts, this being taken to mean that the heavy stocks of wire nails and wire carried by the jobbers through the winter months are now moving out more freely. We quote wire nails at \$1.85 in carload and larger lots; painted barb wire, \$1.85; galvanized, \$2.15; annealed fence wire, \$1.65; galvanized, \$1.95, and cut nails, \$1.85, all f.o.b. cars, Pittsburgh, usual terms, with full freight to destination added.

Merchant Pipe.—It is stated that while stocks of pipe carried by the mills and by the jobbers are heavier than for several years, jobbers' stocks have commenced to move out a little more freely. The large pipe mill of the National Tube Company, at Lorain, Ohio, has shut down temporarily, but is expected to start up again in the near future. It is believed that specifications against contracts for pipe in April will show a material increase over March. In spite of the rather unsatisfactory condition of the pipe trade as regards new demand, it is stated that prices are being well maintained.

Boiler Tubes.—The demand for merchant and locomotive tubes is showing a slight increase, but is not satisfactory to the mills by any means. The boiler tubes for the 95 locomotives ordered by the Baltimore & Ohio Railroad are expected to come to a local mill. It is stated that regular discounts on boiler tubes, printed elsewhere in this issue, are being maintained.

Coke.—The market continues very quiet in both furnace and foundry coke. It is stated that two or three inquiries for furnace coke are in the market for last half of the year delivery, but these are regarded as feelers. The output of coke in the Upper and Lower Connellsville regions last week was 453,986 net tons, a decrease over the previous week of nearly 9000 tons. We quote standard makes of furnace coke running less than 1 per cent. in sulphur at \$2.10 to \$2.15 per net ton, at oven, while outside makes of furnace coke running higher than 1 per cent. are as low as \$1.60 per net ton, at oven. We quote best makes of 72-hour foundry coke for current orders at \$2.85 to \$3 per net ton, at oven, but on a large inquiry it is probable that as low as \$2.60 could be done.

Iron and Steel Scrap.—The coal strike has already interfered with the scrap trade to some extent, consumers being afraid to take in scrap for extended delivery, fearing that they may be compelled to shut down for lack of coal before the strike is settled. In fact, most of the leading consumers have declined offers of scrap in the last few days for this reason. The general tone of the scrap market is weaker, and the impression seems to be that prices will possibly go off to some extent. The scrap lists of the Baltimore & Ohio, Pennsylvania Lines West and Erie Railroad closed on Wednesday, April 6, and it is understood that bids made by dealers were lower than on the previous lists.

Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Monessen and Pittsburgh...	\$16.75 to \$17.00
Heavy steel scrap, Sharon, Pa., delivery	16.50
No. 1 foundry cast	16.00 to 16.25
No. 2 foundry cast	15.00 to 15.25
Bundled sheet scrap, at point of shipment	13.50 to 13.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	17.50 to 17.75
No. 1 railroad malleable scrap	16.00 to 16.25
Grate bars	11.50 to 11.75
Low phosphorus melting stock	20.50 to 21.00
Iron car axles	26.50 to 27.00
Steel car axles	22.75 to 23.00
Locomotive axles	27.50 to 28.00
No. 1 bushing scrap	14.50 to 14.75
No. 2 bushing scrap	11.00 to 11.25
Old car wheels	16.25 to 16.50
Sheet bar crop ends	17.00 to 17.25
Cast iron borings	9.75 to 10.00
Machine shop turnings	11.75 to 12.00

We note sales of 4000 to 5000 tons of heavy steel scrap at \$17 to \$17.15, delivered in the Pittsburgh, Monessen and Steubenville districts; 1000 tons of heavy steel scrap in the Sharon district at \$16.50; 1000 tons of turnings at \$12, delivered, Pittsburgh; 1200 tons of borings at \$10, Pittsburgh, and 600 tons of sheet bar crop ends at \$17.25 to \$17.50, at shipping point.

The offices of Edmund W. Mudge & Co., La Belle Iron Works, Lackawanna Steel Company, Phillips Sheet & Tin Plate Company, Lincoln Coal & Coke Company and Pittsburgh Gas & Coke Company have been removed from the eighth floor to larger quarters on the sixth floor of the Frick Building, Pittsburgh.

Chicago.

FISHER BUILDING, April 6, 1910.—(By Telegraph.)

Weather conditions have been very favorable in the Mississippi Valley. We are having an early spring and so conditions have been unusually propitious for work in the fields, which insures a large acreage of crops that are seeded or planted in the spring. There had been some fear that the season may be too dry, but the situation has been relieved this week by general rains. This creates a favorable atmosphere in the business world, as agricultural conditions are always an important factor in Western trade, and there is a tendency at present in business circles to magnify anything unfavorable, however remotely it may affect business. Structural steel business for the first quarter has shown results that were not generally expected, new contracts aggregating a tonnage in excess of the same period in any former year except in 1906 and 1907. In view of the advance in mill cost of material on January 1, when old contracts with the mills expired and the uneasiness in the financial world during February, with light bookings from railroads, this showing for the structural trade is considered very satisfactory. Rail orders are now going to Eastern mills from this market, but the principal Western roads have already covered their requirements. The unusual demand for bars continues and there is also active inquiry for refined iron and special grades of steel. The bar iron mills have emerged safely from a dull winter market, and their active purchase of scrap indicates improvement in the demand for their product. The hard steel bar mills are sold as far ahead as they consider safe, since they cannot purchase material for any long future delivery. The scrap market is easier this week, especially in steel scrap, which Eastern mills have been able to purchase in this market for shipment to the Pittsburgh district. In the metals, the demand is confined to early deliveries.

Pig Iron.—The pig iron market continues in an unsettled condition and is very hard to follow. Prices of Southern iron are no weaker than they have been, but in fact seem to show a slight improvement over the conditions of 10 days ago. There is no pressure now to sell spot iron, and several sales of a considerable tonnage, at figures near what is considered the minimum of \$12.50, Birmingham, would indicate that an attractive order does not have as much effect on the level of prices as a short time ago. There are many old inquiries which have accumulated during two or three months from buyers who are still indifferent in regard to closing. There was a sale last week of 3000 tons from a Tennessee furnace to a local elevator interest, with other scattering sales and inquiries for smaller amounts. In Northern iron the situation is even more quiet than in Southern grades. A local foundry has bought 1000 tons of No. 2 Northern, and a sale is noted in the Milwaukee district of 1000 tons of low phosphorus. Prices quoted from Chicago and Milwaukee furnaces are out of reach of competition from Ohio furnaces, and the local interests are not aggressive in seeking business. One of the Jackson County furnaces has quoted open prices on high silicon iron 50 cents lower than the figures recently quoted in this correspondence, or \$1.50 below the January schedule, and while other furnaces in the Jackson County district do not appear to have met the reduction, the demand is so light that one furnace can make the market and the revised figures are therefore quoted. The following quota-

tions are for April, May and June shipment, Chicago delivery:

Lake Superior charcoal	\$19.00 to \$19.50
Northern coke foundry, No. 1	18.50 to 19.00
Northern coke foundry, No. 2	18.00 to 18.50
Northern coke foundry, No. 3	17.50 to 18.00
Northern Scotch, No. 1	19.00 to 19.50
Southern coke, No. 1	17.10 to 17.60
Southern coke, No. 2	16.85 to 17.35
Southern coke, No. 3	16.60 to 17.10
Southern coke, No. 4	16.35 to 16.85
Southern coke, No. 1 soft	17.10 to 17.60
Southern coke, No. 2 soft	16.85 to 17.35
Southern gray forge	16.10 to 16.60
Southern mottled	15.85 to 16.35
Malleable Bessemer	18.00 to 18.50
Standard Bessemer	19.00 to 20.40
Jackson Co. and Kentucky silvery, 6%	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8%	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10%	21.90 to 22.40

(By Mail.)

Billets.—The market is quiet and consumers are evidently having less trouble in obtaining regular supplies from Eastern mills.

Rails and Track Supplies.—The Chicago mills report no business done in standard rails the past week, except a few scattering orders for seconds. Eastern mills represented here have a number of inquiries for small lots from Western railroads, as well as from traction companies. The railroads continue to be heavy buyers of track supplies and will need all they can get from the mills this summer, as the Western roads, even on their main lines, have a great deal of track that needs overhauling. We quote standard railroad spikes at 1.85c. to 1.95c., base; track bolts with square nuts, 2.40c. to 2.60c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$27; 30 to 35 lb., \$27.75; 16, 20 and 25 lb., \$28; 12 lb., \$29, Chicago.

Structural Material.—It is understood here that the new business taken by the leading fabricating interest during the first quarter of 1910 amounted to a larger tonnage than in any corresponding period of other years, with the exception of 1906 and 1907. This is a better showing than current reports during the winter would indicate. Contracting was checked somewhat in January by the higher prices which fabricators had to ask, as their contracts made a year ago for plain material at low prices expired December 31, and investors in new buildings held off, hoping to avoid having to pay the advance in mill cost of material. In February the condition of the stock market and rumors in financial circles had a deterring effect on new business and this feeling of unrest wore off slowly during March. The statement made, however, refers entirely to new business, and does not include specifications on contracts. Business for the second quarter will undoubtedly include a large amount of railroad bridge work, which should have been placed during the winter. Only a few contracts of any note were closed in Western territory last week. The general contract for the Yeon Building at Portland, Ore., was let to Thompson & Starrett and the American Bridge Company will furnish the fabricated material, 900 tons. The American Bridge Company has also taken orders for 500 tons of plate girder bridges for the Chicago, Burlington & Quincy Railroad. The Silver Bow County Courthouse at Butte, Mont., was let to contractors, who, it is understood, will sublet the steel work, 800 tons, to the Minneapolis Steel & Machinery Company. This company also took the contract for a car barn, 100 tons, at Grand Junction, Colo. Bids are pending on a considerable number of buildings in Chicago and the West, which will be let in the near future. It has been announced that H. C. Lytton, proprietor of the Hub clothing store in Chicago, will erect two steel buildings on State street, the architects having begun work on plans for one of them. Bids have gone in for the new car shops for the Big Four Railroad near Indianapolis, which will require nearly 6000 tons of steel. We quote plain material from mill, 1.73c. to 1.78c., Chicago; from store, 2c., Chicago.

Plates.—There is a fair volume of current business in tank and universal plates, and steel car business is now coming forward in a very satisfactory manner. The local mill of the leading interest has been booked well ahead since last summer. We quote mill prices at 1.73c. to 1.78c., Chicago; store prices, 2c., Chicago.

Sheets.—The local independent maker finds no lack of business in prospect for its new sheet mills, which will be ready in the near future, as soon as the crude steel is available to operate them. The demand is particularly good for blue annealed sheets, although reports reach this market from the East of shading in prices of galvanized sheets, probably due to the recent decline in spelter. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—It is understood that the implement manufacturers will buy late and specify early the coming year. They still have a considerable tonnage coming to them on specifications placed last fall and winter, and their rush of spring trade does not give them any time now to think of the future. Business from other sources, however, is coming

along steadily on soft steel bars. The mills rolling hard steel bars are also sold ahead about as far as they care to go, as they cannot contract for rail stock for more than 60 to 90 days' supply, and this material is relatively scarce at present. During the winter the iron bar mills did not take enough new business to cover their daily production, but specifications on contracts taken last fall carried them through and new orders are coming in better now. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.55c. to 1.60c.; hard steel bars rolled from old rails, 1.55c. to 1.60c., all Chicago.

Rods and Wire.—The wire trade is getting back to a normal basis, as the mills are catching up slowly on specifications from industrial buyers, while in the jobbing branch of the trade the large stocks which jobbers accumulated are being distributed to the retail dealers. It is believed, however, that the actual retail demand from farmers has not begun yet. Weather and soil conditions have been unusually favorable for work in the fields, and the farmers have taken advantage of it. They usually build fence when the ground is too wet for field work. This condition, however, does not affect the demand from the mills, which continues very good. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

Merchant Steel.—The mills which roll smooth machinery steel are embarrassed by the unusual demand for this product on which they are booked to the limit. On miscellaneous forms and qualities of steel the mills have also exhausted all the excuses known to the trade for their inability to keep up with the store demand. On bar mill products the demands upon stocks in store are unusually urgent.

Cast Iron Pipe.—The Milwaukee letting of 3000 tons of water pipe last week went to the United States Cast Iron Pipe & Foundry Company. There is a good run of orders from small municipalities throughout the West. The railroads also are specifying freely, most of this business coming at the present time in the form of small orders rather than in large contracts. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$28.50; 6 to 12 in., \$27.50; 16-in. and up, \$26.50, with \$1 extra for gas pipe.

Metals.—There is a little quiet buying of spot copper by consumers in this market, amounting, in fact, to a fair volume of business; but there is not much interest shown in forward deliveries. Pig tin is quoted higher, as a part of the advance last week has been maintained. Spelter is very quiet, with no change in prices, an interesting feature of the market being the fact that large consumers have less advantage over the ordinary carload buyer than was the case some time ago. There has been a slight concession in the price of lead and the market is so quiet that the spread in prices is narrower than usual. We quote Chicago prices as follows: Casting copper, 13½c.; lake, 13¾c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, car lots, 33¾c.; small lots, 35c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.70c. to 5.80c.; Cookson's antimony, 10¾c., and other grades, 9¾c. to 10¼c.; sheet zinc is \$7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¾c.; copper bottoms, 12c.; copper clips, 13¼c.; red brass, 12¾c.; yellow brass, 10c.; light brass, 7c.; lead pipe, 4½c.; zinc, 5.25c.; pewter, No. 1, 23c.; tin foil, 26c.; block tin pipe, 28c.

Old Material.—The market is a little easier this week on steel scrap, and Eastern buyers have been able to take a considerable tonnage from the Chicago market for delivery to mills in the Pittsburgh district. The prices paid here would make heavy melting steel cost about \$17.50 per gross ton, delivered at those mills, which is higher than Pittsburgh quotation. Eastern buyers, however, are usually willing to pay more for Western scrap than for material offered in their own market. The prices realized in Chicago on this business are equal to \$14.75 to \$15 for delivery to mills in this district. The Inland mill here has accumulated so large a stock that it takes but little steel scrap outside of what is due from dealers on contracts, and the Gary interests have not been active buyers recently. Cast scrap is also weaker in this market, as well as railroad and agricultural malleable, in sympathy with the decline in prices the past month in pig iron. The railroads continue to get good prices for their wrought scrap, but the market is weak for what dealers ship from their yard as railroad wrought, and in some cases this material has gone as low as \$14.25 per net ton, delivered. The market for old car wheels is quiet. There have been more freight cars scrapped than new ones built in the past two years, and this has made a large stock of old wheels in the hands of foundries, railroads and dealers. The car wheel foundries are reluctant buyers and this makes a stagnant market, but a few lots have been sold recently around \$17, delivered. There is a good supply of material coming in

and the railroads are offering more than they sold a month or two ago. Following prices are per gross ton, delivered, Chicago:

Old iron rails.....	\$18.50 to \$19.00
Old steel rails, rerolling.....	18.00 to 18.50
Old steel rails, less than 3 ft.....	18.50 to 17.00
Relaying rails, standard sections, sub- ject to inspection.....	24.00 to 25.00
Old car wheels.....	17.00 to 17.50
Heavy melting steel scrap.....	14.75 to 15.25
Frogs, switches and guards, cut apart.....	14.75 to 15.25
Shoveling steel.....	14.25 to 14.75

The following quotations are per net ton:

Iron angles and splice bars.....	\$17.00 to \$17.50
Iron car axles.....	21.50 to 22.00
Steel car axles.....	23.00 to 23.50
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	13.50 to 14.00
Springs, knuckles and couplers.....	14.00 to 14.50
Locomotive tires, smooth.....	18.50 to 19.00
No. 1 dealers' forge.....	12.00 to 12.50
Steel axle turnings.....	11.00 to 11.50
Machine shop turnings.....	9.75 to 10.25
Cast and mixed borings.....	6.50 to 7.00
No. 1 bushelling.....	12.00 to 12.50
No. 2 bushelling.....	9.50 to 10.00
No. 1 boilers, cut to sheets and rings.....	11.00 to 11.50
No. 1 cast scrap.....	14.00 to 14.50
Stove plate and light cast scrap.....	12.00 to 12.50
Railroad malleable.....	14.00 to 14.50
Agricultural malleable.....	12.50 to 13.00
Pipes and flues.....	11.00 to 11.50

Philadelphia.

PHILADELPHIA, Pa., April 5, 1910.

Quieter conditions prevail in the market for both crude and finished materials; in fact, with the exception of some fair sized business in basic pig iron, transactions have been almost entirely in small lots. Consumers have adopted a more pronounced waiting attitude, particularly when the quantity of material to be purchased is of any size. A tendency toward easier prices is also observed, although rolled products for prompt shipment remain comparatively firm. Low prices continue to be named for fabricated structural material, which, however, may have the effect of bringing about more active conditions in building. Railroad buying in this territory has been rather quiet, but the Baldwin Locomotive Works reports an order for 90 engines of miscellaneous types from the Southern Railway. The old material market has an easier appearance; very little business has been done, although a more plentiful supply is noted in some grades.

Pig Iron.—Basic sales continue the only important transactions in this territory. A further sale of 10,000 tons for third quarter delivery to an Eastern steel mill at a confidential price is announced, and while it is not confirmed, it is believed that \$17.75, delivered, was shaded to meet competition from producers outside the district, principally from the West. A sale of another 10,000-ton block is reported to have been made at \$17.75, delivered, or probably at a shade less. These transactions have all been quietly made, while further inquiry for second and third quarter delivery is understood to be still before the trade. Transactions in foundry iron have been comparatively light; melters seem disinclined to make heavy purchases at the present time, and the various inquiries for third quarter and second half delivery are still held in abeyance. Sellers, for the most part, are not forcing business, as to do so would probably result in a lower range of prices. The bulk of the transactions in both Northern and Virginia foundry grades have been in lots of 100 tons or less at prices varying from \$18 to \$18.25 for No. 2 X, delivered in this territory, with an occasional sale at \$18.50, delivered, for either prompt or second quarter shipment, while in some cases the same range of prices will apply for third quarter or even more extended delivery. The movement in low grade iron has been small, cast iron pipe makers and sellers of pig iron being still somewhat apart in their views of prices. The largest sale reported during the week was one of some 600 tons for early shipment. No sales of forge iron for rolling mill purposes have been announced, although consumption is slightly improved. Prices for standard brands of forge iron are now being pretty firmly maintained. Very little inquiry is noted for standard grades of low phosphorus iron; some business is reported, however, in low phosphorus Bessemer, which can be had several dollars per ton less than standard grade. Less inquiry for pig iron for forward shipment from buyers in this district is reported, and prices for such delivery have not been very well established; for prompt or second quarter, delivered in buyers' yards in this vicinity, the following range of prices is named:

Eastern Pennsylvania, No. 2 X foundry.....	\$18.00 to \$18.25
Eastern Pennsylvania, No. 2 plain.....	17.50 to 17.75
Virginia, No. 2 X foundry.....	18.00 to 18.50
Virginia, No. 2 plain.....	17.75 to 18.25
Gray forge.....	16.75 to 17.00
Basic.....	17.75 to 18.00
Standard low phosphorus.....	23.00 to 23.50

Ferromanganese.—There has been no demand, most consumers being covered for some time ahead. The nominal quotation of \$42, Baltimore, could, no doubt, be shaded about 50c. a ton on desirable business.

Billets.—Specifications on contracts have been particularly heavy since the first of the month. Some moderate sized orders for second quarter delivery have also been booked, and while there is a tendency shown on the part of buyers to consider business for third quarter shipment, makers have not openly quoted on such delivery. Standard open hearth rolling billets continue firm, at \$30.60, delivered in this vicinity, although for ordinary miscellaneous material this price could, no doubt, be shaded. Forging billets are firm, at \$32 to \$34, Eastern mill, dependent on specifications and analysis.

Plates.—Business placed during the week has been largely of a miscellaneous character, although the aggregate tonnage has been of fair proportions, but not equal to the capacity of the mills. While there is a good volume of business pending and in sight, consumers purchase largely for early requirements, although in a few instances orders have been taken on which deliveries extend over into the third quarter. Eastern mills, which can, as a rule, make prompt deliveries, hold rather firmly to 1.75c., delivered, for ordinary plates in carload lots; in competition, however, or when time of shipment is not a factor, 1.70c., delivered in this territory, can be readily done.

Structural Material.—Several building and bridge propositions which have been before the trade for some little time still hang fire, while no new business of importance has come out. The Emerson Hotel contract in Baltimore, Md., requiring several thousand tons of material, has been let, the fabricated price at which it was placed being, it is understood, extremely low. The demand for ordinary plain material drags and business recently placed has been largely of a miscellaneous character. Prices do not appear to be very firm, 1.70c., delivered in this territory, representing the ruling quotation for ordinary plain shapes.

Sheets.—Specifications continue heavy and the general run of day to day business keeps mills in this territory fully occupied. The outlook is good, and makers refuse to accept orders for other than near future deliveries. Quotations are firmly maintained, ranging as follows for deliveries running over the next 30 or 60 days: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—While there is still a fair volume of business in steel bars, the larger makers are from three to four months back on deliveries. Small merchant mills in this territory can, however, make fair shipments, although their range of sizes is limited. Orders for refined iron bars have been light and prices are weak. The leading producers name 1.55c. to 1.60c., delivered in this territory, as a fair range of prices, although those figures have been shaded by some of the smaller mills. Steel bars are quoted at 1.60c. to 1.65c., delivered here.

Coke.—Business is largely of a spot character. Most consumers refuse to renew contracts, covering only for their immediate needs, and awaiting further developments. Foundry coke for early shipment is quoted at \$2.50 to \$3 per net ton at oven, while prompt furnace coke ranges from \$1.65 to \$1.85 at oven, with \$2.10 to \$2.25 named for second-half shipment. For reasonably early delivery in this territory the following range of prices per net ton is quoted:

Connellsville furnace coke.....	\$3.90 to \$4.10
Foundry coke.....	4.75 to 5.25
Mountain furnace coke.....	3.50 to 3.70
Foundry coke.....	4.35 to 4.85

Old Material.—Transactions have been less active and the market has an easier appearance, due largely to an increased supply of scrap in producers' hands. There has been no movement in heavy melting steel, and rolling mills show less disposition to enter the market. Sales have been unimportant and some grades of rolling mill scrap show a decline owing to increased offerings. In the other grades hardly enough business has been done to establish quotations, which nominally range about as follows for deliveries in buyers' yards in this vicinity:

No. 1 steel scrap and crops.....	\$16.50 to \$17.00
Old steel rails, rerolling.....	17.75 to 18.25
Low phosphorus.....	21.50 to 22.00
Old steel axles.....	22.00 to 23.00
Old iron axles.....	28.00 to 28.50
Old iron rails.....	20.50 to 21.50
Old car wheels.....	16.75 to 17.25
No. 1 railroad wrought.....	19.50 to 20.00
Wrought iron pipe.....	16.00 to 16.50
No. 1 forge fire.....	14.00 to 14.50
No. 2 light iron.....	10.00 to 10.50
Wrought turnings.....	12.00 to 12.50
Cast borings.....	11.00 to 11.50
Machinery cast.....	16.00 to 16.50
Railroad malleable.....	16.00 to 16.50
Grate bars.....	13.75 to 14.25
Stove plate.....	12.00 to 12.50

The Union Switch & Signal Company, one of the Westinghouse interests, is now operating to full capacity its plant at Swissvale, near Pittsburgh. Nearly double as many men are being employed as compared with the same time a year ago. Since the first of the year sales have been above the average.

Cincinnati.

CINCINNATI, OHIO, April 6, 1910.

A résumé of first quarter results in the iron and steel trade in this market shows crude and finished material both to have exceeded in tonnage the sales of the same period of 1906. Warehousing in finished lines has been especially good and pig iron sales agencies have practically all exceeded their bookings for the first quarter of 1906. One of the large agencies stated to-day that the March tonnage was the best in the history of its local establishment; another that the first three months of this year exceeded that of the 1906 first quarter, which was a record breaker. There is not expected to be any considerable change before June in the existing market conditions, which reflect a regrettable lassitude on the part of consumers. Coke is unchanged and scrap is weaker.

Pig Iron.—No doubt exists that some large deals in iron are under consideration and that some contracts are being quietly made. Sales agents generally express themselves much at sea on prices, and while all admit that they hear of \$12, Birmingham, on Southern iron, nothing lower than \$12.50 for No. 2 standard iron can be verified; but it is certain that this price can for the present be done for the entire last half. The malleable and basic deals are setting the pace in iron to-day, and furnaces advantageously located are making some exceedingly low prices. Furnace representatives in this district vigorously deny that the St. Louis deals announced as having been made on the \$15.50 basis can be charged to them. American Rolling Mill Company officials announce the purchase of 25,000 tons of basic for delivery over the last half. This iron comes from nearby furnaces having advantageous delivery charges. A large steel maker in central Ohio is buying 1000 tons of basic for last half and some special irons. A large car manufacturing interest is reported to have bought 20,000 tons or more of malleable and foundry, and \$15.50, Iron-ton, is heard in connection with this deal, without official confirmation. The same reports are current in connection with a purchase of 2000 to 3000 tons by a malleable concern in St. Louis territory. Some Alabama iron on track is selling here at \$12 for No. 2, cash on delivery, and occurrences of this kind have apparently influenced consumers, who seem disposed to believe that this will be the open price ere the close of April. Two 200-ton lots of iron are being closed to-day with parties in western Pennsylvania and southern Ohio, the first for second quarter, the other a high manganese, for prompt shipment. An official letter from a Southern producer accused of liberal shading announces \$12.50 for prompt, \$13 for second and third quarter and \$13.50, minimum, for fourth quarter business. Another large Southern producer announces some iron for immediate and second quarter delivery at \$12.50, but nothing to offer for last half. High silicons are very quiet, as are also charcoal and other special irons. For immediate delivery and remainder of the year, based on freight rates of \$3.25 from Birmingham and \$1.20 from Iron-ton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$16.25 to \$16.75
Southern coke, No. 2 foundry.....	15.75 to 16.25
Southern coke, No. 3 foundry.....	15.25 to 15.75
Southern coke, No. 4 foundry.....	15.00 to 15.25
Southern coke, No. 1 soft.....	16.25 to 16.75
Southern coke, No. 2 soft.....	15.75 to 16.25
Southern gray forge.....	14.75 to 15.00
Ohio silvery, 8 per cent. silicon.....	20.20
Lake Superior coke, No. 1.....	17.70
Lake Superior coke, No. 2.....	17.20
Lake Superior coke, No. 3.....	16.70
Standard Southern car wheel.....	25.25 to 25.75
Lake Superior car wheel.....	22.25 to 22.75

(By Mail.)

Ferrolloys.—Steel makers are interested in the official announcement by the Baltimore & Ohio Railroad, which is indorsed by other Eastern lines, giving notice of a reduction in carload freight rates on imported ferrosilicon, ferro-manganese and spiegeleisen from Baltimore, Philadelphia and New York to interior points. The new rates are effective May 1. The old and the new rates are given in the following table. The new rates from New York and Philadelphia can be figured by adding 20c. for Philadelphia and 60c. for New York:

From Baltimore to—	Old rate.	New rate.
Chicago.....	\$4.40	\$3.65
Cleveland.....	2.95	2.42
Youngstown.....	2.75	2.25
Cincinnati.....	3.75	3.10
Toledo.....	3.30	2.72
Detroit.....	3.30	2.72

Coke.—Some contracting is noted for Eastern shipment over the last half, but consumers in the Central West are still holding off, although there is considerable unsold consumption for this period. Reports from Fairmont, W. Va., indicate that more attention is given to coke production in that field than ever before. Cars are reported plentiful, and there should be no delays in shipment. On Connellsville furnace grades the current market is about \$1.90 to \$2 per net ton at oven for prompt shipment and on contract \$2.25 to \$2.40. Foundry grades are dull at \$2.75 to \$2.85, prompt and contract. Wise County furnace is quotable at \$1.85 to

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\$2; foundry grades, \$2.50 to \$2.75 for early, and \$2.75 to \$3 for the last half. No change is noted in either Pocahontas or New River.

Finished Iron and Steel.—All jobbers report warehouse business excellent and improving, and the favorable weather has developed a number of important building projects which are maturing. Steel bars are strong, at 1.45c., Pittsburgh, and some interests are still getting 1.50c. Structural material is in excellent demand and practically prompt delivery is guaranteed by prominent interests at the regular base price of 1.55c., Pittsburgh. Iron bars are in but moderate demand and are obtainable at about 1.60c. to 1.65c., Cincinnati mill. Bids will be opened in a few days for the steel to be used in the new factory building of the Victor Safe & Lock Company in Norwood, about 1000 tons; for the Straub Machinery Company, about 165 tons, and for the Engineering College Building of the University of Cincinnati, about 110 tons, exclusive of twisted bars for concrete work and ornamental, of which last there will be some 50 or 60 tons. The Mount Vernon Bridge Company secured the contract for material for the new chipping room of the Buckeye Steel Castings Company at Columbus, Ohio, about 700 tons, and the Central State Bridge Company 800 tons for the new structure of Rumely & Co., Laporte, Ind.

Old Material.—The market has sagged from 25 to 50 cents per ton since last week. There is no buying by consumers, while offerings of railroads and other holders of old material are meager. A few of the largest dealers are covering on short sales, but this about represents the sum total of activities in old material here. Some of the larger dealers have had good sized tonnages of pig iron offered them by Southern furnace representatives, who are anxious to realize cash on prompt shipments, the price of \$12, Birmingham, for No. 2 being heard in this connection. We quote as follows, f.o.b. Cincinnati and southern Ohio yards:

No. 1 railroad wrought, net ton.....	\$13.25 to \$13.75
Cast borings, net ton.....	7.00 to 7.50
Heavy melting steel scrap, gross ton...	13.75 to 14.25
Steel turnings, net ton.....	9.00 to 9.50
No. 1 cast scrap, net ton.....	12.50 to 13.00
Burnt scrap, net ton.....	9.00 to 10.00
Old iron axles, net ton.....	18.00 to 18.50
Old iron rails, gross ton.....	17.50 to 18.00
Old steel rails, short, gross ton.....	15.00 to 15.50
Old steel rails, long, gross ton.....	16.00 to 16.50
Relaying rails, 56 lb. and up, gross ton.	22.00 to 23.00
Old car wheels, gross ton.....	14.00 to 14.50
Low phosphorus scrap, gross ton.....	17.00 to 17.50

Cleveland.

CLEVELAND, OHIO, April 5, 1910.

Iron Ore.—The market continues inactive. Buyers who have not covered for all their expected requirements for the year are holding off until the pig iron market improves. Some contracts for Lake Superior ores are expected later from Eastern furnace interests that have canceled orders for foreign ore. Prices continue firm. We quote as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—The market is very quiet and prices on foundry grades are weaker. Few inquiries have come in during the week, and they were for small lots, mostly 300 tons and under. No. 2 foundry for the second quarter is being offered in the Valley at \$15.75, and it is very probable that purchases could be made at \$15.50 or under. Some of the furnace interests are declining to meet the present quotations and are holding firmly to \$16 for No. 2 foundry for spot and second-quarter delivery, and \$16.50 for the last half. Considerable iron is being piled in some of the furnace yards. Because of the present low prices and light demand it is expected that one merchant furnace in this territory will go out of blast within the next two or three weeks. Corrigan, McKinney & Co. expect to blow in their new furnace in Cleveland on foundry iron about April 15. For spot shipment and second quarter we quote, delivered, Cleveland, as follows:

Bessemer.....	\$18.40 to \$18.90
Northern foundry, No. 1.....	16.75 to 17.00
Northern foundry, No. 2.....	16.25 to 16.75
Northern foundry, No. 3.....	16.00 to 16.25
Gray forge.....	16.15
Southern foundry, No. 2.....	16.85 to 17.35
Jackson Co. silvery, 8 per cent. silicon.	21.05 to 21.55

Coke.—The market continues quiet. Prices are weak at about the recent levels. There is some demand for both grades for prompt shipment, but no contracts are reported. Standard Connellsville furnace coke is quoted at \$1.75 to \$2 per net ton at oven for prompt shipment and \$2.15 to \$2.30 on contract. Connellsville 72-hour foundry coke is held at \$2.50 to \$2.75 for prompt shipment and \$2.75 on contract.

Finished Iron and Steel.—Conditions continue generally satisfactory in the iron and steel trade. Outside of steel bars, however, the demand is not heavy. Some large bar specifications have come from consumers the past few days on contracts that expired April 1. With very few exceptions the buyers specified to the full tonnage of their con-

tracts and quite a number of inquiries are pending for new contracts. The implement makers have come into the market and some mill agencies are quoting them a price on steel bars of 1.45c., Pittsburgh, for specifications until October 1. That appears to be the minimum price in this territory and mills are not disposed to make contracts beyond the third quarter. The demand for iron bars is not active and prices are weak. We note the sale of 1200 tons of iron bars to a car company. We quote iron bars at 1.45c. to 1.50c., Cleveland. The demand for plates in small lots is fair. An improved volume of orders is reported from locomotive companies. Prices are fairly firm at 1.55c., Pittsburgh. The demand for structural material is fair. Some buyers are showing a hesitation about placing contracts in the hope of getting better prices, but the recent quotation of 1.55c., Pittsburgh, is being firmly maintained in this market. Bids will be received this week for the Portage Hotel, Akron, Ohio, 700 tons, and for a pumping station in Detroit, about 500 tons. Bids will be asked for shortly for the steel for the City Investment Company's building, Cleveland, which will require about 1200 tons. Railroad bridge work in being planned in Ohio, Indiana, western New York and western Pennsylvania that is expected to result in the placing of orders for 15,000 to 20,000 tons of structural material within the next 60 days. The demand for shafting continues good. Contracts are being placed to succeed those that expired April 1. There is a steady demand for sheets and prices are being firmly maintained. Business with jobbers continues good, but not as heavy as during parts of last month.

Old Material.—The market is still quiet. Mills and foundries are buying in small lots for immediate needs, but are unwilling to contract for future requirements. There is considerable difference of opinion as to what present prices are, but dealers generally would not be inclined to sell for future delivery at current quotations. Yard dealers continue to buy freely for stock. There is little prospect of an improvement in prices soon. Quotations remain about stationary, with the exception of steel car axles, which are somewhat firmer. Prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$15.50 to \$16.00
Old iron rails.....	17.50 to 18.00
Steel car axles.....	22.00 to 22.50
Heavy melting steel.....	15.00 to 15.25
Old car wheels.....	16.00 to 16.50
Relaying rails, 56 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	14.00 to 14.50
Railroad malleable.....	15.50 to 16.00
Light bundled sheet scrap.....	10.50 to 11.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.50 to \$22.00
Cast borings.....	8.25 to 8.50
Iron and steel turnings and drillings.....	9.00 to 9.50
Steel axle turnings.....	11.00 to 11.50
No. 1 busheling.....	13.00 to 13.50
No. 1 railroad wrought.....	15.00 to 15.50
No. 1 cast.....	14.00 to 14.50
Stove plate.....	12.00 to 12.50
Bundled tin scrap.....	11.00 to 11.50

Birmingham.

BIRMINGHAM, ALA., April 3, 1910.

Pig Iron.—Conditions are quiet, with more or less of a dragging tendency in the pig iron market. Aside from the placing of a few round lots, the business offering has been of a hand to mouth nature. One prominent iron dealer reports that he sold over 2000 tons the past week on a basis of \$13, at furnace, for forward delivery. In the absence of an established base price, \$13, at the furnace, more correctly represents the tendency of the market than other figures. Some few sales have been made at figures slightly lower than \$13, but certain conditions attended such concession. While some of the furnace interests are still asking \$13.50 for delivery over the last quarter, it is a fact that other interests are willing to take on a good tonnage for such delivery at even money. It is a fact that the furnace companies are lessening in their efforts to push sales, due, probably, to the fact that such a policy would only mean no sales and a cessation of inquiries. Inquiries during the week were practically of a like volume of the week previous; probably of a little more earnest nature. It is understood that one or two of the large buyers of the Middle West are negotiating with local interests for requirements through the entire year of 1910. There has been some further curtailment in production, due to the blowing out of a stack. Stocks on yards are not large, as applicable to most of the furnace interests. Warrant iron in the hands of substantial and large brokerage interests practically cuts no figure, due to the fact that it was bought for disposition at a profit, and present conditions will not admit of such a turnover. Charcoal iron is quoted at \$22 to \$22.50, at furnace.

Cast Iron Pipe.—While there has been no great activity in the cast iron pipe market during the week, the immediate prospects as viewed by local interests are considered bright. Sufficient business continues to be booked to take

care comfortably of a full time output. Stocks of pipe on the yards are comparatively small. There has been no decline in prices, but it is understood that to meet certain peculiar conditions existing in some sections of the country slight shading is indulged in. Following prices, per net ton, f.o.b. cars here, are quoted: 4 to 6 in., \$25; 8 to 12 in., \$24; over 12 in., average \$23, with \$1 per ton extra for gas pipe.

Old Material.—Mills appear unwilling to take on more scrap iron at the present time. There has been no change in quotations, though they are more or less nominal. Local dealers manage to keep a good tonnage from their stock moving. No material improvement in the situation can be looked for as long as pig iron remains as inactive as at present. Scrap dealers have shown no disposition to neglect the buying and piling of material, as it can be picked up at fair figures, basing their faith on a substantial improvement in the pig iron market. We quote the following prices, per gross ton, f.o.b. cars here:

Old iron axes.....	\$19.00 to \$19.50
Old iron rails.....	15.00 to 15.50
Old steel axes.....	18.00 to 18.50
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	11.00 to 11.50
No. 1 country wrought.....	10.50 to 11.00
No. 2 country wrought.....	10.50 to 11.00
No. 1 machinery.....	12.00 to 12.50
No. 1 steel.....	11.25 to 11.75
Tram car wheels.....	11.50 to 12.00
Standard car wheels.....	13.50 to 14.00
Light cast and stove plate.....	9.50 to 10.00

St. Louis.

St. Louis, April 4, 1910.

The commerce of the city is showing an encouraging increase, as indicated by the statements of banks and trust companies. Building permits for March numbered 988, with a total cost of \$2,347,944. A marked and growing degree of interest is being manifested in the iron market, but coke continues quiet.

Coke.—Not only are sales confined to small lots, but there are no new inquiries pending for large tonnage. Parties who have been known to be in the market are still holding off. Values are easy—in fact, lower—since we hear of \$2.50 per net ton at oven being named for standard 72-hour Connellsville foundry for any delivery in 1910, with intimations that contracts for shipment over a year could be worked at that figure.

Pig Iron.—Continued interest is shown by buyers—mainly for last half delivery—and some business is being done, though in a few instances the contracts were placed direct with furnaces. Among the inquiries pending are the following: About 1000 tons each of malleable Bessemer and charcoal car wheel iron, for delivery over the second quarter; 2000 tons of malleable Bessemer for last half; 200 tons of basic for second quarter; 500 tons of No. 1 Southern foundry; 500 tons of No. 2 Southern, for delivery over the last half; 850 tons of mixed grades of Southern foundry, for shipment over the remainder of the year. Among the sales reported are 5000 tons of Southern Ohio basic, for delivery over the last half, to a local steel foundry, and 800 tons of analysis iron for shipment over the last half, while all offices are in receipt of a fair number of orders for lots ranging from 100 to 300 tons for various deliveries within the year, though most of the small sales are for delivery during the second and third quarters. Considerable irregularity exists in values, and as part of the business passing is being worked on firm offers, prices in some cases are withheld. Most sellers claim that the chances are in favor of a better market in the fall and prefer to avoid commitments for the more distant delivery. While some furnacemen will not name a price for last half, and others ask \$13 for Southern No. 2 foundry, it is possible to purchase at least in limited quantities at \$12.50 for the second and third quarters, while for nearby delivery most standard brands are offered at that figure, f.o.b. Birmingham. Southern Ohio No. 2 foundry is held at \$16, f.o.b. furnace, for last half delivery.

Finished Iron and Steel.—The demand for standard rails is fair; for light rails, mining interests are holding off owing to the threatened strike, and there is only a moderate inquiry from lumbermen. There is some business doing in structural material with both local and outside fabricators. Steel bars are in good request and prices steady, but iron bars are not active. There is a good demand for all kinds of track material.

Lead, Spelter, Etc.—Lead is ruling quiet, at 4.25c.; spelter steady, at 5.45c. to 5.50c., East St. Louis; zinc ore held at \$41 per ton, Joplin base. Tin is 65c. per 100 lb. higher; antimony is ruling unchanged; copper is off 10c. per 100 lb. The demand for finished metals for the past week was only fair, owing to the close of month.

Old Material.—The demand from consumers, which dealers confidently predicted would be in evidence around April 1, has not materialized, but the market is ruling dull and prices are weak. Railroad offerings are meager, however, and stocks moderate. The only lists reported last week were as follows: Missouri Pacific, 800 tons; Wabash, 200

tons; Vandalia, 8 cars. Relatively, steel scrap is firmest. We quote dealers' prices, which are more or less nominal, as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$15.50 to \$16.00
Old steel rails, rerolling.....	15.50 to 16.00
Old steel rails, less than 3 ft.....	13.50 to 14.00
Relaying rails, standard sections, subject to inspection.....	26.00 to 26.50
Old car wheels.....	15.50 to 16.00
Heavy melting steel scrap.....	13.50 to 14.00
Frogs, switches and guards, cut apart.....	13.50 to 14.00

The following quotations are per net ton:

Iron fish plates.....	\$14.00 to \$14.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	13.00 to 13.50
Railway springs.....	12.50 to 13.00
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	11.00 to 11.50
Mixed borings.....	7.00 to 7.50
No. 1 bushing.....	12.00 to 12.50
No. 1 boilers, cut to sheets and rings.....	10.50 to 11.00
No. 1 cast scrap.....	13.00 to 13.50
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	12.00 to 12.50
Agricultural malleable.....	10.50 to 11.00
Pipes and flues.....	10.50 to 11.00
Railroad sheet and tank scrap.....	9.00 to 9.50
Railroad grate bars.....	10.50 to 11.00
Machine shop turnings.....	10.50 to 11.00

Eastern capitalists are seeking to effect an arrangement of the affairs of the St. Louis Car Company, owing to belief in the possibilities of that business in this locality. The plan is to cause the bankruptcy proceedings which have been pending against the company for more than a year to be withdrawn through effecting a settlement with the creditors. It is reported that the basis will be 25 per cent. cash to general creditors and payment of secured creditors in full in consideration of a transfer of the entire assets and business of the company.

The Bemis Brothers Bag Company is spending \$100,000 in erecting a seven-story addition to its present plant, 615-19 South Fourth street. The addition is to be strictly fire-proof in construction.

The McKinley Traction Company has purchased property in the vicinity of Twelfth and Morgan streets on which to erect an express depot. It will be a four-story structure and will cost about \$100,000.

The Southwest Wire & Iron Company, Kansas City, has been incorporated; capital stock, \$6000; incorporators, H. C. Schumacher, N. F. Woehler, A. L. Old and others.

The National Perforating Machine Company, Kansas City, certifies to an increase of capital from \$100,000 to \$200,000.

Buffalo.

BUFFALO, N. Y., April 5, 1910.

Pig Iron.—The week has been marked by a period of quietness so far as new buying is concerned, but the tone of the market is somewhat firmer, with less shading of prices and less effort being put forth on the part of furnacemen to secure business at prices lately prevailing, which many of them consider unremunerative. Consumers are apparently waiting to ascertain if the bottom has actually been reached in prices and for the most part are not actively in the market. In consequence the inquiry is light and comparatively little new business has been booked. Shipments on contracts are heavy. We quote as follows for second and third quarter delivery, per gross ton, f.o.b. Buffalo, as closely representing the market, although offers have been accepted by some furnace interests at 25c. to 50c. per ton below these prices:

No. 1 X foundry.....	\$17.25 to \$17.75
No. 2 X foundry.....	17.00 to 17.25
No. 2 plain.....	16.75 to 17.00
No. 3 foundry.....	16.50 to 16.75
Gray forge.....	16.25 to 16.50
Malleable.....	17.00 to 17.50
Bessemer.....	19.00 to 19.25
Basic.....	17.00 to 17.50
Charcoal.....	20.00 to 20.50

Finished Iron and Steel.—Business in bars and finished products continues good, with no cessation of the pressure on mills for shipments on contracts, and there has been some improvement in structural plates and shapes. The demand for cold-drawn steel, tin plate and uncoated tin mill products is strong and in the latter considerable difficulty is being experienced in placing all the tonnage required. The tone of the market is a little firmer as regards prices. The local agency of the leading interest reports that the quarter just ended shows a very large increase in business in this district over previous periods of the same length, the aggregate tonnage in bars especially being very heavy both for domestic consumption and Canadian export. Since the settlement of the tariff question with Canada the Canadian trade has exhibited a disposition to specify more freely on contracts and also to close new business in bar material, structural shapes and plates. In structural material the favorable building weather is bringing out increased busi-

ness, particularly in small structural jobs, running up to 100 tons. Some fabricating contractors are now so well filled with orders that they are declining the smaller work. Plans have been completed and bids are to be received the latter part of the month for the Union Building, to be erected at Syracuse by John J. Cummins and Joseph Dunfee, taking about 800 tons of steel. The Buffalo Grade Crossings Commission this week decided to build viaducts over the New York Central, Grand Trunk, Delaware, Lackawanna & Western and Erie railroads at Amherst and Austin streets, near the International Bridge approach (instead of subways, as previously decided), requiring a large tonnage of steel.

Old Material.—The market has shown greater activity the past week than for some time previously and there has been an increased disposition to trade. The tendency of prices has been toward lower levels, which has had the effect of inducing greater buying. More material is also being offered to dealers, owing to the spring cleaning up by producers of scrap material, and dealers are evidently disposed to part with some of their holdings at lower prices—25c. to 50c. per ton in some lines. Railroad malleable and iron axles are 75c. to \$1 per ton under prices at which they have recently been held. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$15.25 to \$15.75
Low phosphorus steel.....	19.50 to 20.00
No. 1 railroad wrought.....	16.50 to 17.00
No. 1 railroad and machinery cast scrap.....	15.50 to 16.00
Old steel axles.....	19.50 to 20.25
Old iron axles.....	23.00 to 23.50
Old car wheels.....	16.00 to 16.50
Railroad malleable.....	15.50 to 16.00
Boller plate.....	13.00 to 13.50
Locomotive grate bars.....	12.00 to 12.50
Pipe.....	12.50 to 13.00
Wrought iron and soft steel turnings.....	8.50 to 9.00
Clean cast borings.....	7.75 to 8.25
No. 1 busheling scrap.....	13.50 to 14.00

San Francisco.

SAN FRANCISCO, CAL., March 30, 1910.

A cable was received from China this week, announcing the closing of a contract whereby the Western Steel Corporation, Seattle, agrees to take 100,000 tons of Hang Yang pig iron and 100,000 tons of iron ore annually for 15 years. A general revival is noted in nearly all departments. Cast iron pipe orders are larger than for some time, and there are indications of an exceptionally heavy tonnage of steel pipe within the next two years. Bookings for delivery from mills of smaller sizes of merchant pipe and bars are still limited, but March has brought a material reduction of the large supplies in store here. There is continued delay in the placing of large fabricating orders for structural material. Arrivals of foreign steel have been comparatively heavy.

Plates.—In addition to the recent Portland water works contract, the tonnage of plates booked has been fairly large and prospective requirements for the summer are heavy. The San Francisco Gas & Electric Company is preparing to erect a new gas holder at a cost of about \$300,000, and similar work is contemplated by gas companies in southern California. The rapid increase in the production of oil and its use as fuel is bringing out a large volume of tank business throughout California and Arizona.

Bars.—Notwithstanding the liberal arrival of foreign bars, supplies in store here are decreasing rapidly. The jobbing movement has increased steadily through March and consumers no longer show any hesitation in filling their requirements of the near future, the movement at present being at least normal. The failure of the demand in January and February, however, has left the local merchants with rather unwieldy stocks, and they are not yet inclined to purchase on a large scale. Orders for delivery from domestic mills are accordingly light, though the tonnage is somewhat larger than a month ago. The jobbing market in general remains firm, but a feeling of easiness has developed in reinforcing bars of some descriptions, the movement of which is still below expectations. Reports of prices being shaded cannot be verified, and on everything but reinforcing bars quotations are fully maintained. Bars from store, San Francisco, are quoted at 2.50c. for steel and 2.30c. for iron.

Rails.—The tonnage of rails for logging and street railroads booked in March has been of fairly large proportions, as many of the smaller coast interests have been in the market for the summer's improvements. Mining interests are comparatively small buyers at the moment, but are expected to come into the market on a larger scale within the next two months. There has been a considerable movement of 8-lb. sections, principally in connection with the fruit industry. The movement of standard sections is fully up to the recent average, but there is nothing unusual in the situation.

Structural Material.—The local structural situation is characterized by long delay in the letting of contracts, occasioned largely by plans for more expensive work than financial conditions warrant. The Olympic Club has again been withdrawn and the revised plans will call for only about 700 tons. An award is expected shortly on the Native Sons' Hall

in San Francisco, about 1000 tons, and the Native Sons of Los Angeles are planning a building which will require about 1400 tons. A small tonnage of Bethlehem shapes will be fabricated for the United Realty Building at Sacramento, Cal., by a local contractor. Milliken Bros. have taken 450 tons for the Chester Building at Seattle, Wash. An order for 275 tons for the Heeseman Building in Oakland, Cal., was awarded to the Judson Mfg. Company. Bids have been taken on 300 tons for a Masonic temple at North Yakima, Wash. A small contract has been taken by the Western Iron Works for the west wing of the Southern Pacific Hospital. Inquiries are coming up for a large tonnage for Los Angeles, where a theater and a club building are to be erected shortly. In Portland, Ore., plans are being made for a large addition to the courthouse and for a building for Lippman, Wolf & Co. which will take considerable steel. The Pacific Hardware & Steel Company is at work on plans for two buildings at Portland, to cost \$150,000. The Hillidie Machine Company and the Polson Implement Company will soon begin construction on a six-story warehouse at Seattle, Wash. Locally, numerous small jobs are coming out, but the tonnage required is small, and competition is very keen for all the larger work coming up, with some tendency to cut prices on fabricating work. The supervisors have extended the time for removal of temporary buildings from the fire limits until May 1, 1911, an action which is expected to result in further delay on some of the work in prospect. While some foreign material is arriving, supplies of plain material in store here are limited and prices are held at the former level, beams and channels, 3 to 15 in., being quoted at 2.70c. from store, San Francisco.

Pig Iron.—A slight increase in the volume of local foundry work has brought correspondingly greater activity to the pig iron market, though the requirements of the larger foundries are amply provided for. There is some buying for fall delivery at about the prices previously quoted. Local arrivals of foreign iron are moderate and some reduction is being effected in spot supplies. The importers, however, have sufficient stock for all immediate demands and the situation is rather easy. Spot prices show considerable range, according to seller, but leading importers quote \$24 for Continental, \$24.50 for English and \$25 for Chinese, Southern foundry iron being nominally valued at \$23.50.

Cast Iron Pipe.—Business is more active than at any time since the first of the year, small orders being fully as large as last month, while some business of moderate importance has been transacted within the last two weeks. The United States Cast Iron Pipe & Foundry Company has taken orders for 2200 tons for the Los Angeles water works and 3000 ft. of 4-in. pipe for Vallejo, Cal. Several large gas pipe projects are about to materialize, though in some of this work steel pipe will probably be used. The Piedmont Gas Company, Los Angeles, will shortly commence improvements to cost \$300,000, extending the system to several outside towns. The San Diego Gas & Electric Company is planning improvements on a still larger scale, involving the installation of nearly 50 miles of pipe.

Merchant Pipe.—The smaller sizes are now beginning to move actively in a jobbing way, but the large stocks taken on by local merchants about the end of the year, in anticipation of an advance, have not yet been greatly reduced. Orders from these interests for delivery from the mills accordingly remain at a minimum. The outlook in connection with the oil industry is most encouraging. Recent reports of projected pipe line construction are regarded as exaggerated, but the laying of nearly 1000 miles of pipe in southern California and Arizona within the next few years is considered practically certain. Railroad officials operating in that territory state that the present oil traffic is interfering seriously with their freight and passenger service, and the increased output within the last few months will make this condition worse. The only relief will be a pipe line from the Kern District to Los Angeles and another to a distributing point in Arizona. The Arizona Pipe Line Company has been incorporated at Bakersfield, Cal., with a capital of \$25,000,000, by parties largely interested in the Union Oil Company, the American Oil Fields Company, the Producers' Transportation Company and the Independent Sales Agency. The San Francisco Gas & Electric Company is planning to lay a 16-in. line about 7 miles long across the city, the material to be steel tubing.

Old Material.—Offerings of steel melting scrap are pretty well cleaned up locally, and while the immediate demand is not large, prices are well maintained. Little wrought iron scrap is coming out at the moment, though a considerable tonnage will be on the market within a short time. The principal movement is in cast scrap, for which there has been a good inquiry from some of the foundries which have taken contracts for municipal work. There is less on the market than for many months. Heavy cast scrap is quoted at \$18 per gross ton; steel melting scrap, \$11 per gross ton; railroad wrought scrap, \$13 per net ton, rerolling rails, \$12 per net ton.

The City Iron Works, Los Angeles, has taken a contract

to furnish iron castings for the ensuing year to the first department of that city.

The Southern Pacific Railroad will spend about \$500,000 this year on improvements to its car shops in Los Angeles.

The Eureka Foundry, Eureka, Cal., will install a battery of six boilers for the Cody Lumber Company, Bandon, Ore.

C. M. Howard, president of the Commonwealth Steel Company of St. Louis, Mo., is in San Francisco.

The plant of the Olympia Foundry & Machine Works at Tacoma, Wash., was destroyed by fire March 29, the loss being \$150,000.

The Albion Iron Works Company, Ltd., Vancouver, B. C., will open bids April 20 for the purchase of its entire plant.

The Burton Saw Company, Vancouver, B. C., has purchased a site for a factory at Bellingham, Wash.

W. B. Coberly is now in New York for the purpose of securing machinery, &c., for the Tucson Iron Works, Tucson, Ariz.

The German Iron Market.

BERLIN, March 25, 1910.

"Quiet but firm" is the curt form of the latest news from the iron trade. At the fortnightly trading in iron on the Düsseldorf Exchange a week ago no changes in prices were noted. It is reported, however, that German foundry and hematite pig are selling in the market at 1 to 2 marks higher than the Düsseldorf quotations, owing to the upward tendency of ore prices. The newly organized ore syndicate in the Siegerland district proposes to raise prices by 1 mark the ton next month. From the Luxemburg-Lorraine district it is also reported that the price of ores has slightly risen. In the same region there is great activity in the ore business and at the furnaces, as the stocks of nearly all kinds of pig iron have become well nigh exhausted. Puddling and foundry iron can only be had there in small lots. Yesterday it was reported on the stock market here that the Coal Syndicate was going to reduce the export drawback on exported iron products by 1 mark per ton on April 1, but stock operators were rather skeptical about this news; and, upon the whole, the tendency of quotations for iron shares has been rather weak for some time. The stock market has evidently given up its optimism about the iron trade. This week it has given some anxious consideration to the remarks of an important ironmaster of Silesia, who complained in a speech that it was no longer possible for many of the companies in that region to earn a profit on their investment owing partly to the burdens imposed by the labor legislation of the country and partly to Germany's tariff and commercial treaty policy.

This pessimistic utterance, however, does not reflect the general feeling of the trade—at least not in the western part of the country, where a hopeful view of the market's prospects still prevails. Nearly all the works have orders on their books that will keep them employed to the end of June, and some of them are working under a considerable strain in order to keep their engagements on time. It is admitted, however, that the situation in America and England is having a considerable effect upon the German market, as it induces a disposition to wait and see what will happen before making new arrangements. The news from the Belgian market also continues to disappoint the German trade. According to news from Charleroi this week the recently noted weaker tendency of prices has continued, and it even appears to be gaining in intensity. Goods for export are also now going at lower prices there. About a fortnight ago bars of wrought iron were quoted for export at £5 10s. to £5 12s. per ton, f.o.b. Antwerp; but now the price is £5 7s. 6d. to £5 9s. per ton. Bars and plates of soft steel have also lost about 2s. per ton.

The capital increase of the Deutsch-Luxemburg Company has turned out to be greater than was expected. The issue will be 15,000,000 marks, after the company had added 8,000,000 to its capital only last October. The new issue, which will bring its capital up to 65,000,000 marks, is for the purpose of acquiring a half-interest in a coal company at Karlingen on the Saar, and for opening up ore deposits in Lorraine and across the frontier in France. This company has a special interest for the American iron trade, since it holds the European rights to the Grey patents.

The Ludwig Loewe Company, Berlin, which is well known in the American machinery trade as a manufacturer of machine tools upon American models, has declared a dividend of 16 per cent., being the same as for 1908. The German Niles Tools Works, closely affiliated with the Loewe concern, has again failed to declare a dividend, but it is doing a better business than in previous years, having taken on other branches of manufacture besides the making of the heaviest class of machine tools.

In the courts at Pittsburgh a decree in dissolution was made on the application of the George A. Hogg Iron & Steel Foundry Company. The concern discontinued business some time ago and has no debts.

New York.

NEW YORK, April 6, 1910.

Pig Iron.—The past week has been one of the quietest of the year. The largest inquiry reported as now before the trade is for 900 tons for a Hudson Valley foundry. Recent purchases by pipe works included considerable Southern iron, on a portion of which water transportation was specially arranged for by the buyer. Foundries are melting at fully as great a rate apparently as at any time in the past six months, but few of them are interested in iron for third quarter consumption. We quote Northern iron at tidewater, delivery in the second quarter, as follows: No. 1, \$18 to \$18.25; No. 2 X, \$17.75 to \$18; No. 2 plain, \$17.50 to \$17.75. Southern iron is to be had at \$17.50 to \$18 for No. 1 and \$17 to \$17.50 for No. 2.

Steel Rails.—The Chicago Electric Railway is reported in the market for 5000 tons of girder rails. Business with steam roads continues light so far as Eastern mills are concerned, and three or four mills are prepared to make quick deliveries. The Illinois Steel Company booked 12,650 tons of rails last week, including one order for 10,700 tons of open hearth rails.

Finished Iron and Steel.—In the amount of business done in all lines of finished iron and steel March was about on a par with February. Particularly in structural materials, it was considerably behind March of a year ago, so far as tonnage is concerned, but the prices prevailing at that time were all much lower. The last week in March showed quite material improvement, and April has opened decidedly better. The prospects are excellent for the month as a whole, and should continue bright thereafter. New business in bar iron is coming in in much better volume, and a marked improvement has been noticeable in the last 10 days. Good totals, but mostly small orders, seems to be the rule in all lines. Several railroads have come forward with inquiries for bridge materials, although few of them are of much size. The Chesapeake & Ohio has taken 2100 tons from the American Bridge Company, the Southern Railway is in the market for 750 tons, and bids have gone in for 350 tons for the Northern Pacific. The Boston & Albany, the Boston & Maine and the Pennsylvania in the East, and the Michigan Central, the Burlington and the Rock Island in the West, are each inquiring for a small amount. Altogether it is taken as encouraging, and the indications are believed to be favorable for a large number of inquiries during the month, with decisions on most of them. Among building contracts which have been closed is the Emerson Hotel in Baltimore, 2200 tons, taken by the American Bridge Company, also a textile mill at New Bedford, Mass., 800 tons, and the following, all in New York City and singularly all 12-story buildings, in all of which Bethlehem shapes have been specified: Loft building on West Twenty-third street, 800 to 1000 tons, Hay Foundry & Iron Works, contractor; loft building, West Twenty-seventh street, 1200 tons, Alfred E. Norton Company, contractor; loft building, West Twenty-eighth street, 600 tons, Hinkle Iron Company, contractor; another on the same street of same amount, for which Milliken Bros., Inc., is the contractor; two loft buildings on West Twenty-fifth street, one of 600 and the other of 800 tons, both taken by Milliken Bros.; and an apartment house at Ninety-eighth street and Broadway, 700 tons, taken by Rabitch Bros., Long Island City. The time for receiving bids on the Merchants' and Manufacturers' Exchange (two buildings requiring 8000 tons) has been extended to April 11. Matters of general interest but not likely to affect this territory are the pending issuance of specifications for Panama Canal lock gates, for which some 58,000 tons of steel plates and shapes, it is believed, will be required finally, and the fact that the implement makers are looking about preparatory to making their contracts for another year. No changes are reported in prices. Plates and plain structural materials are quoted at 1.66c. to 1.71c.; steel bars at 1.61c. to 1.66c., and bar iron at 1.65c. to 1.70c., tidewater.

Cast Iron Pipe.—The Department of Water Supply, Gas and Electricity will open bids April 13 for water pipe for Brooklyn, specifying 1000 lengths of 12-in. pipe, 6000 lengths of 8-in. and 1000 lengths of 6-in. This is the most important public letting in sight at present. Municipalities now in the market are buying only moderate quantities. While the general demand from water and gas companies is keeping up fairly well, the business originating from those sources is spasmodic and does not show anything like the vigorous buying which is usual at this season. Consumers of pipe are evidently influenced by conditions in the pig iron trade and hesitate to make commitments beyond their urgent necessities. Quotations are continued at \$25.50 to \$26 per net ton, tidewater, for carload lots of 6-in.

Old Material.—The withdrawal of another important eastern Pennsylvania steel company from the buying combination is a source of considerable gratification to dealers. This increase in the number of independent buyers of steel scrap widens the market for the operations of dealers, and a larger business is expected in the near future, intimations

of which are already current. The raising of embargoes on Pennsylvania mills has not yet led to much new business, but as dealers having old contracts have been able to deliver considerable quantities of scrap, the prospects of the market are thus improved to that extent. The week has not witnessed a general buying movement, yet in almost every class of material a little larger business is being done, the fine spring weather being conducive to more active outdoor work and thus stimulating many branches of trade. Certain classes of old material, however, are completely neglected, old car wheels being conspicuous in this respect. The following quotations are per gross ton, New York and vicinity:

Rerolling rails.....	\$15.00 to \$15.50
Old girder and T rails for melting.....	14.25 to 14.75
Heavy melting steel scrap.....	14.25 to 14.75
Relaying rails.....	22.50 to 23.00
Standard hammered iron car axles.....	25.00 to 25.50
Old steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	16.75 to 17.25
Wrought iron track scrap.....	14.50 to 15.00
No. 1 yard wrought, long.....	14.50 to 15.00
No. 1 yard wrought, short.....	14.00 to 14.50
Light iron.....	8.00 to 8.50
Cast borings.....	9.00 to 9.50
Wrought turnings.....	10.50 to 11.00
Wrought pipe.....	13.50 to 14.00
Old car wheels.....	14.50 to 15.00
No. 1 heavy cast, broken up.....	14.00 to 14.50
Store plate.....	11.00 to 11.50
Locomotive grate bars.....	11.00 to 11.50
Malleable cast.....	15.00 to 15.50

Metal Market.

NEW YORK, April 6, 1910.

THE WEEK'S PRICES.

Cents per pound.							
Copper.			Lead.		Spelter.		
Mar.	Lake.	Electro-lytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
31....	13.75	13.25	33.50	4.40	4.25	5.60	5.45
April.							
1....	13.75	13.25	33.25	4.40	4.25	5.60	5.45
2....	13.75	13.25	....	4.40	4.25	5.60	5.45
4....	13.75	13.25	33.00	4.40	4.25	5.60	5.45
5....	13.75	13.25	32.70	4.40	4.25	5.60	5.45
6....	13.75	13.25	32.90	4.40	4.25	5.60	5.45

The metal market generally is quiet and uninteresting. Copper is dull and lead is disappointing. No transactions worthy of note, in any line, have been reported. The expected spring buying has not yet developed.

Copper.—The copper market has weakened a trifle, and there is very little trading. The larger interests, however, are optimistic and are not inclined to make any concessions in prices. Lake is still quoted at 13.75c. and electrolytic at 13.25c., although it is stated that some offers have been made as low as 13.62½c. for lake and 13.12½c. for electrolytic. Exports for the month up to April 6 aggregated 945 tons. The London market to-day was £58 2s. 6d. for spot copper. Futures closed at £59 5s. and the market is reported as steady. Sales reported were 300 tons for spot and 500 tons for futures. L. Vogelstein & Co. report the German consumption of foreign copper for the months of January and February, 1910, as follows: Imports, 29,465 tons; exports, 10,95 tons; making the total consumption 28,370 tons, as compared with consumption during the same period in 1909 of 23,019 tons. Of this quantity 26,563 tons was imported from the United States.

Pig Tin.—The pig tin market is quiet and buyers do not seem to have much confidence in it. The speculative movement, with a sharp rise and quick decline, has not helped it any. Business is slow and buyers all seem to be on the waiting list. The statistics show shipments of tin from the Straits Settlement for the second half of March as follows: United States, 125 tons; London, 452 tons; European continent, 200 tons, making a total of 770 tons. For the entire month of March, shipments from the Straits totaled 2877 tons against 3380 tons for March, 1909. The combined deliveries of London and Holland for March were 25 tons larger than the same month last year. Australia shipped the same amount as in March, 1909. We quote to-day, 32.70c., New York. Arrivals of tin this month figure out 1390 tons, with 2430 tons afloat. London prices to-day were for spot tin £150 and for futures £152 2s. 6d. Sales amounted to 300 tons of spot and 1000 tons of futures.

Tin Plates.—The situation in tin plates is an interesting one. The regular base price at the mills is \$3.60, or \$3.84, New York, but it is stated that plates are getting scarce every day and premiums are paid for prompt shipment. The railroad's have made some purchases lately. The foreign price of 13s. 6d. at Swansea is the same as last week.

Lead.—Lead is dull and unchanged. The price remains 4.40c. to 4.42½c. The American Smelting & Refining Company is asking 4.50c., New York. Very few sales have been reported.

Spelter.—Spelter can still be had in New York for 5.60c. Few sales have been made, and there does not seem to be any reason for expecting a change in the market at an early date.

Antimony.—Hallett's is selling for 8.25c., Cookson's from 8.37½c. to 8.50c., and the Hungarian grades can be had for 7.50c.

Old Metals.—The tendency is downward. Dealers' selling prices are quoted as follows:

	Cents.
Copper, heavy cut and crucible.....	12.75 to 13.00
Copper, heavy and wire.....	12.00 to 12.25
Copper, light and bottoms.....	11.25 to 11.50
Brass, heavy.....	9.00 to 9.25
Brass, light.....	7.25 to 7.50
Heavy machine composition.....	11.50 to 11.75
Clean brass turnings.....	8.25 to 8.50
Composition turnings.....	10.00 to 10.25
Lead, heavy.....	4.15 to 4.25
Lead, tea.....	3.90 to 4.00
Zinc scrap.....	4.50 to 4.75

Iron and Industrial Stocks.

NEW YORK, April 6, 1910.

The stock market has been inclined to quietness since last week's report, but most issues have shown a tendency to greater strength, the highest prices during this period having been realized on Monday and Tuesday of this week. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.....	10	Railway Spr., com.	39½-40
Allis-Chalm., pref..	37½-37¾	Republic, com.....	35½-37
Beth. Steel, com..	30-30¼	Republic, pref.....	99-100
Can, com.....	10¾-11¼	Sloss, com.....	75½-76
Can, pref.....	73½-74½	Pipe, com.....	20½-21½
Car & Fdry, com..	61½-63½	Pipe, pref.....	72-72½
Steel Foundries...	56-57	U. S. Steel, com..	81½-85¼
Colorado Fuel....	38¼-40	U. S. Steel, pref..	119-120
General Electric...	149-150¼	Westinghouse Elec.	63-68½
Gr. N. ore cert....	63¾-67½	Am. Ship, com.....	74
Int. Harv., com...	91-93	Chl. Pneu. Tool...	44½-45¼
Int. Harv., pref..	121-121½	Cambria Steel....	47½-48½
Int. Pump, com...	43	Lake Sup. Corp...	21½-23½
Int. Pump, pref..	83-84½	Penna. Steel, pref..	114
Locomotive, com..	49½-51½	Warwick.....	11½-11¾
Locomotive, pref..	112½-114	Crucible St., com..	14-14¼
Nat. En. & St., com.	20½-21¼	Crucible St., pref..	84½-85½
Pressed St., com...	40½-42	Harb.-W. Ref., com.	35
Pressed St., pref..	101½-102		

Last transactions up to 1 p.m. to-day are reported at the following prices: United States Steel common 85½, preferred 120½, bonds 104¼; Car & Foundry common 65, preferred 117½; Locomotive common 53, preferred 114; Colorado Fuel 40¼; Pressed Steel common 43½, preferred 102; Railway Spring common 40¼; Republic common 37½, preferred 100; Sloss-Sheffield common 78; Cast Iron Pipe common 21½, preferred 72½; Can common 11¼, preferred 75½; Allis-Chalmers common 10, preferred 37¼.

Reports which appeared in the daily press recently that the Pennsylvania Steel Company, Steelton, Pa., or some other steel concern would probably absorb several iron and steel works in the vicinity of Harrisburg are officially denied by E. C. Felton, president of the Pennsylvania Steel Company, who says that the reports are entirely without fact.

The monthly meeting of the mechanical section of the Engineers' Society of Western Pennsylvania was held in the Fulton Building, Pittsburgh, on the evening of April 5. J. C. W. Greth of the Wm. B. Scaife & Sons Company, Pittsburgh, presented a paper, entitled "The Selection of a Boiler Feed Water," which was illustrated with lantern slides.

Exceptions have been taken to the receiver's sale of the plant of the Delaware River Iron Shipbuilding & Engine Works, Chester, Pa., on March 24. Argument will be made to the court April 9. It is understood that the property had been appraised at \$280,000, and the selling price of approximately \$153,000 is claimed to have been insufficient.

The Susquehanna Iron Company, Columbia, Pa., started up its skelp mill April 4. The Susquehanna mill, producing muck bar only, was also started. These departments have been idle for about three months, during which time extensive repairs were made. The pipe mill, which was shut down two weeks for repairs, was also put in operation again on the above date.

The Bethlehem Steel Company's Report.

The Bethlehem Steel Company's report for the year ending December 31, 1909, presents the following income account, including the results of operations of subsidiary companies:

	1909.	1908.
Net manufacturing profit.....	\$2,654,457	\$2,020,208
Other income.....	182,136	172,147
Total net income.....	\$2,836,593	\$2,192,355
Special interest items.....	149,518	140,667
Balance	\$2,087,075	\$2,051,688
Bond interest, &c.....	1,386,263	1,314,824
Balance	\$1,300,812	\$736,864
Depreciation	500,000	370,000
Net income for year.....	\$800,812	\$366,864
Previous surplus.....	2,467,264	2,100,400
Total surplus.....	\$3,268,076	\$2,467,264

From President Charles M. Schwab's accompanying statement to the stockholders the following extracts are taken:

"The total estimated amount of the orders booked by the corporations, uncompleted orders, and the number of employees, are as follows:

Years.	Orders booked during year.	Uncompleted orders. Dec. 31.	Employees. Dec. 31.
1907.....	\$15,615,018	\$8,514,665	9,783
1908.....	14,458,997	7,592,502	8,615
1909.....	28,696,516	14,073,834	11,594

"The operation during the past year of the rail and structural mills erected by the Bethlehem Steel Company in 1906-1908 has conclusively proved the advisability of greatly increasing their capacity. The advantages of the new structural steel shape have been more quickly recognized than anticipated. The entire present output is readily sold, and easily double the amount could be marketed if the steel producing facilities were adequate to allow the operation of the rolling mills to anything like their present capacity.

"The total payroll for the year aggregated \$7,066,734; this gives average annual earnings per man of \$721.61. These average earnings include 1010 men at our mines in Cuba, where the rate of wages is considerably lower than in the United States. Eliminating these, the average of the yearly earnings of men in the States is \$760.42. These figures are about the same as reported by other corporations in the same line of business.

"Since the close of the fiscal year ended December 31, 1909, contracts have been entered into by the Bethlehem Steel Company in the sum of over \$10,000,000, for armor, armament, ammunition, spare parts and accessories for ships for the navy of the Argentine Republic, so that at the date of this report the uncompleted orders on the books of the subsidiary companies of the corporation aggregate about \$25,000,000.

"It is evident that we are on the eve of a great demand and prosperity, and it was especially desirable that our steel producing departments should be completed, so that our rolling mills might be run to their full capacity. It was consequently considered advisable to increase our melting capacity by the addition at the Bethlehem plant of Bessemer converters, which, in conjunction with the present open hearth furnaces, will manufacture steel by the so called duplex process, and will at least double our output."

The report reviews the recent financing of the company, and states that the expenditure of \$5,000,000 should double or more than double the earning power of the present investment of about \$12,000,000 in these new mills. In reference to the contract with the Didier-March Company for a period of 20 years, President Schwab says the contract is most advantageous to the company, as it assures an adequate supply of coke at a very satisfactory price.

Much is expected from the reorganization of the Pan-American Railroad, which promises to push its

line through to Guatemala, then by way of Santa Arria or Sonsonate to Salvador, along the coast to Honduras and Nicaragua, possibly tapping Leon, and through Costa Rica to Panama. Until this line is finished countries like Colombia, Ecuador, Peru, Paraguay and Bolivia will find themselves, to a degree, isolated. The Panama Canal will also do much to bring them into closer contact with the United States, especially because most of them are on the Pacific Coast or are tributary to the Pacific Ocean directly or indirectly.

Westinghouse Equipment Installations.—At Bennettsville, Ga., the Southern Cotton Oil Company has installed a 200-hp. Westinghouse gas producer plant, and at Greenwood, S. C., the same company is building a similar power station for its local factory. This equipment is additional to the 1000-hp. in gas producers and engines recently installed at its Montgomery, Ala., plant. The Bennettsville equipment consists of a Westinghouse type T-35 bituminous producer and a 16 x 18-in. three-cylinder gas engine. At the Greenwood factory a 15 x 14-in. three-cylinder engine is served by a Westinghouse producer. At the Montgomery plant, two type T-50 Westinghouse bituminous producers supply power gas for gas engines totaling over 900 hp. In all of these factories the gas engines are belted to line shafting, through which the power transmission is made to the machinery in the mill buildings.

The Buenos Aires Exposition.—A South American correspondent writes: "The building of Argentine battleships in the United States is a subject of deep interest in Buenos Aires, and not a few see in this an indicator of closer commercial and general relations between the two countries. The exposition to be held at Buenos Aires, it is hoped, will attract many Americans in all lines of business, as well as those who travel to gain a clearer knowledge of South American advancement and general conditions. It is safe to say that Buenos Aires alone, as a city, will be a most agreeable surprise to most of our people. It has fine streets, beautiful parks, large opera houses and impressive public buildings. It is a city of over a million inhabitants."

The Blaw Collapsible Steel Centering Company, Pittsburgh, is manufacturing steel centers for conduit construction for the Ontario Power Company, Niagara Falls, Ont., part of which work has been completed. The Catskill aqueduct took a large number of Blaw steel centers. A shipment of 35 cars of centers was made to the Isthmus of Panama, being the second contract from the Government. Other recent shipments include Seattle and other domestic sewerage installations.

Canada's interest in the maintenance of its shipping lines is shown in the fact that when the Mexican Government recently revoked its subsidy of \$250,000 per annum to the Pacific Steamship Company, which runs line of vessels between Canadian and Mexican ports, the Canadian Government assumed the amount of the Mexican subsidy. The steamship service is thereby continued.

The Vulcan Crucible Steel Company, Aliquippa, Pa., manufacturer of crucible and acid open hearth steel, is building a reinforced concrete machine shop, 40 x 100 ft. It is also moving its hammers into a new building, 75 x 200 ft., which was erected during the depression.

Two dynamite explosions March 29 wrecked the center of a large building under construction for the American Steel Foundries at Indiana Harbor, Ind. They were ascribed to labor troubles of the constructing company.

Wage Advances to Iron Miners.

Preparations for Record Lake Superior Shipments.

MARQUETTE, MICH., April 2, 1910.—Effective April 1 all the mining companies operating in the Lake Superior iron region have announced increases in the various rates of wages, such as were referred to in *The Iron Age* of March 31. Thousands of men on all five producing ranges are benefited. The increases range from 6 to 8 per cent., and in all cases they are voluntary. No organizations of miners or other workers in any of the districts have made demands. The increases are due to the increased demand for ore and the realization of the employing interests that it is costing their employees more for actual living expenses than it did two years ago.

All the mining companies are looking forward to a season when they will reach their greatest activity. Shipments are starting unusually early, some ore already having been forwarded to the docks. As practically all of the other ore carrying lines have done, the Duluth, South Shore & Atlantic Railroad is increasing its rolling stock, having ordered 300 ore cars from the American Car & Foundry Company, to be delivered next month, and eight locomotives. The car is different from any now in use on the range, being built with a steel frame and bottom, but with wooden sides. The cars are of 50-ton capacity, and are equipped with a rapid dumping device.

New Operations on the Mesaba.

The Mesaba range village of McKinley is situated over an ore body controlled by the Republic Iron & Steel Company, and it is understood that this deposit will be mined in the near future, necessitating moving the town to a new location. The Republic Company's Wills mine is within two or three blocks of the central portion of the village on the west, and from this mine drifts have been run under the town site in various directions for the purpose of determining the extent of the ore body and the best system of mining.

The erection of new steel shafthouses has been completed at the Schley mine and material is being assembled for an additional shaft at the Pettit. The Republic Company has spent large sums of money the past two years in development and improvement work at the Schley.

The Steel Corporation has made an important discovery of ore close to the former site of the village of Sparta, where it is developing the Genoa mine as an open pit producer. Drills operating on the Murphy-Dorr-Flynn lands on the north shores of Cedar Island Lake, southwest of the Genoa, have shown up a large deposit. It is understood that the ore body is more than 100 ft. thick. As the Genoa property is being stripped the extent and general size of the deposit is found to be greater than the drills indicated before the village of Sparta was moved. The mine will be an extensive shipper this year.

The actual stripping of the Buffalo & Susquehanna Company's Susquehanna mine, occupying 80 acres directly adjoining the residence portion of Hibbing on the east, is now in progress, with two steam shovels employed. This is one of the largest stripping contracts ever undertaken on the Mesaba and will require from six to eight years to complete.

Active preparations are under way preliminary to the stripping of the St. Paul property at Keewatin, Mesaba range. This mine belongs to the Corrigan, McKinney & Co. interests of Cleveland. It has been closed about two years. Between the St. Paul and the More property at Stevenson, the Steel Corporation has a force of 125 men at work with 25 diamond drills, and it is said that considerable ore is being found. The development of the More mine is in progress.

Crucible Steel Company of America Improvements.

Extensive improvements are being made by the Crucible Steel Company of America at the Park Works, Pittsburgh, which will largely increase the facilities for shipping and handling material. Two 60-ft. crane runways have been erected along the Allegheny Valley Railroad from Thirty-first to Thirty-second street, a distance of about 400 ft., and a single crane runway, with a 60-ft. span, has been erected along Thirty-first street from Smallman street to the railroad. The structural work is being done by the McClintic-Marshall Construction Company. These runways are being installed for the purpose of enabling the economical and prompt handling of a large tonnage of billets at this plant.

The company's Aliquippa Works at Aliquippa, Pa., had been idle for a number of years, but owing to the urgent and heavy demand the plant was recently reopened and it has been in full operation for some little time. This week it was necessary to commence operating this works on double turn on account of the pressure of orders. At the Atha Works, Harrison, N. J., the company is now arranging to enlarge its open hearth plant by the construction of one or two furnaces. At its Sanderson Works, Syracuse, N. Y., the company has recently erected a 3-ton hammer, which places it in position to take care of the larger sizes of crucible steel ingots, a considerable portion of the increased output of this plant being in the larger sizes of high quality crucible bars.

Great Northern Holdings in Mesaba Iron Mining Companies.

The application of Louis W. Hill, James N. Hill, Walter J. Hill and Edward T. Nichols, trustees of the Great Northern iron ore properties, to have the trust certificates listed on the New York Stock Exchange, gives the list of securities owned by the trust as follows:

Shares.	Par value.	Total.
750 West Mesaba Land Company.....	\$1,000	\$750,000
500 Tyler Iron Mining Company.....	100	50,000
500 Arthur Iron Mining Company.....	100	50,000
500 Fillmore Iron Mining Company.....	100	50,000
500 Harrison Iron Mining Company.....	100	50,000
500 Jackson Iron Mining Company.....	100	50,000
500 Polk Iron Mining Company.....	100	50,000
5 Van Buren Mining Company.....	100	500
1,000 Leonard Iron Mining Company.....	100	200,000
5,879 North Star Iron Company.....	100	648,800

The application states that the companies whose stocks are held by the trustees control by ownership or leasehold 65,091 acres of land in the Mesaba iron ore district in Minnesota, which at the date of the creation of the trust were estimated to contain upward of 500,000,000 tons of iron ore. Of these lands, 39,295 acres are covered by the lease to the Great Western Mining Company, the subsidiary of the United States Steel Corporation. Only 1597 acres of other land are under lease, but under these leases, all made prior to December 7, 1906, the date of the trust agreement, important mines have been developed. Owing to the leases having been made at times when royalties were less than at present, the income from these other leases is not important and the price realized per ton is less than under the contract with the Great Western Mining Company.

The Keystone Steel Foundry Company, Avonmore, Pa., which manufactures gray iron castings from 10 lb. to 5 tons in weight, is preparing to start operations in its steel casting department. W. D. Curry, an experienced foundryman from Meadville, Pa., is the company's Pittsburgh sales representative, succeeding H. S. Imhoff.

Electric Furnace Results at Worcester, Mass., and South Chicago, Ill.

Some interesting data are given in the following from the *Electrical World* concerning the results of the operation of the 15-ton Héroult electric furnaces at the Worcester, Mass., plant of the American Steel & Wire Company and the South Chicago works of the Illinois Steel Company:

At South Chicago the Héroult electric furnace is used to refine molten metal obtained from the ordinary acid lined Bessemer converter. The electric process, therefore, includes both desulphurization and dephosphorization. The Héroult furnace has been in continuous operation at South Chicago since May, 1909, and has demonstrated that it is now a commercial metallurgical apparatus no longer in the experimental stage. The average of heats made per day is 12. The furnace is in continuous operation except on Sundays, the operation being discontinued on Sunday because the converter plant does not work on that day.

The specific energy consumption depends, of course, on the impurities in the charge and the desired composition of the refined steel. When both desulphurization and dephosphorization are required, the electrical energy required per net metric ton is about 190 kw.-hours, but when the charge supplied to the furnace is low in phosphorus, this has been reduced in commercial operation to about 100 kw.-hours per net metric ton. The time of the heat varies approximately between 1 hour and 1½ hours, counting only the time while the electric current is on. During a whole day the intervals between the successive heats—that is, the time when no electrical energy is consumed—may amount to about one-third of the whole time.

The electrical energy is generated by means of gas engines operated with blast furnace gas, the two plants of the Steel Corporation at South Chicago, Ill., and Gary, Ind., being electrically connected in parallel. The charge for energy supply made to the electric furnace plant is ½ cent per kw.-hour actually consumed, as taken from the meters. At South Chicago it is a disadvantage that no space was available for the electric furnace plant in the immediate neighborhood of the Bessemer plant so that the molten Bessemer metal has to be brought to the electric furnace over a distance of ¼ mile.

The cost of repairs of the Héroult furnace is said to be very low. A silica roof is stated to last for 129 heats, while the repairing of the bottom is done by shoveling in some dolomite in the intervals between successive heats. The total cost of repairs is given as approximately 6 cents per ton.

The consumption of electrodes averages 6 lb. per ton of steel, and this figure is stated to be true both for graphite and amorphous carbon. The electrodes, as used at present, are made of Acheson graphite rods, 48 in. long and 8 in. in diameter. Three such rods are butt connected to a total length of 144 in. and three such 144-in. rods are arranged side by side to form a single electrode consisting of a solid bundle of three rods with the cross section a true shamrock.

The electric steel produced in South Chicago is used for rails, axles, &c. At Worcester, Mass., the Héroult furnace is used to refine molten steel obtained from the basic open hearth, and since the metal obtained from the open hearth is already largely dephosphorized, the time of the heats is shorter and the specific energy consumption in the average is less than at South Chicago, but no exact figures from commercial practice are yet available. The electric steel produced at Worcester is used especially for fine wire, such as piano wire. This furnace has been in operation since January, 1910.

The Bethlehem Steel Company, South Bethlehem, Pa., will blow in the first of its new blast furnaces on

Thursday of this week. The venerable John Fritz, who was one of the founders of the company and for many years managed its operations, will apply the torch to the new furnace. The starting of this furnace will be an epoch in the company's history, as it marks the development of its furnace department on modern lines.

Stevens Institute Asks a War Tax Refunded.

The trustees and alumni of the Stevens Institute of Technology, Hoboken, N. J., have undertaken active measures to recover a sum of money which was paid to the United States Government as an inheritance tax in 1870. Promptness in payment is now known to have been the real cause of the institute's loss, for other charitable and educational institutions which delayed were exempted by special laws. The tax was paid in compliance with a war measure, made necessary by the extraordinary needs of the Government. When Edwin A. Stevens died leaving \$650,000 to the institute for educational purposes, the bequest was assessed \$45,750. Less than one month after the receipt of the bill from the internal revenue collector the tax was paid.

Some time before that Matthew Vassar made a large bequest to Vassar College and this came under the same law. But the executors delayed payment, and in July, 1870, Congress passed a special law remitting the tax. The same Congress gave relief to church and school properties in Massachusetts, and a later Congress to the Young Men's Christian Association of the District of Columbia. But the Stevens Institute money was already in the United States Treasury, and repeated efforts to recover it brought no result. The trustees petitioned Congress again and again. The appeals being met with indifference, efforts ceased for a time. Finally Dr. Alexander C. Humphreys, the present president, undertook to have the matter recalled to the attention of Congress.

Almost without exception the Congressmen who have examined the claim have expressed themselves as satisfied that it is just. A bill allowing the money has been introduced in each house—in the House of Representatives by Hon. W. H. Wiley and in the Senate by Hon. John Kean. The House Committee on Claims and the Senate Committee are now considering the measure. President Humphreys has pledged himself that if the money is allowed every cent of it will go to swell the institute's endowment. Nothing is to be deducted for expenses incurred in urging the restitution or as commissions for agents.

The Stevens Institute was the first to establish a college of mechanical engineering, and the many colleges now engaged in that branch have followed the lines laid down at Stevens. There are 1500 graduates of the institute now engaged in the upbuilding of the industries of the country. These graduates, all of whom are interested in the movement to recover the tax, feel confident that Congress will make amends for the discrimination against the institute.

Statistics compiled by the *American Wool and Cotton Reporter*, Boston, show that 50 per cent. of the spindles in Southern cotton mills were idle in the latter part of March. The curtailment of the production of cotton goods, owing to the scarcity and high price of cotton, is stated to be more extensive and drastic than ever before known in the history of the trade, even taking into consideration the panic year 1907.

The Bostrom-Brady Mfg. Company, Atlanta, Ga., and St. Louis, Mo., reports that sales during March materially exceeded those of any other month since its farm and builders' levels were placed on the market.

New Publications.

Civil Engineering as Applied in Construction. By Leveson Francis Vernon-Harcourt. Second edition, revised by Henry Fidler, M. Inst. C. E., F. G. S. Size, 6 x 9 in.; 626 pages; numerous illustrations; bound in cloth. Price \$5.00. Published by Longmans, Green & Co., London, and Fourth avenue and Thirtieth street, New York.

This work is one of the standard volumes of Longman's civil engineering series, the first edition of which was brought out in 1901. A new edition having been called for since the decease of the distinguished author, a revision was made by Henry Fidler, who is the author of the article on "Dockyards" in the *Encyclopædia Britannica* and "Notes on Construction in Mild Steel." It is stated that the descriptions of engineering works which at the date of the publication of the first edition were in course of construction or an early stage of initiation, were naturally subject to such revision as the progress of events had rendered necessary, and it was further evident that works of magnitude which, during the period elapsed since the issue of the first edition, have been commenced and for the most part brought to a successful conclusion should receive such notice as the scope of the work would permit. Subject to these considerations, the author's text was, as far as possible, left intact, while such examples have been included as would best illustrate the progress of civil engineering within the last eight or ten years.

Steam Power Plant Piping Systems.—By William L. Morris. Bound in cloth. Size 6½ x 9½ in.; 481 pages; 389 illustrations. Price \$5 net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York.

This publication treats of the design, installation and maintenance of piping systems, and, therefore, only such parts of the power plant system as are directly related to piping are touched upon. The book contains 32 chapters, and is divided into two parts, one dealing with piping systems and the other with piping details. The first contains an introduction on the origin of improper piping, followed by a chapter on how to lay out piping diagrams and six others on piping systems, condensers and heaters, live steam drips, blow-off and exhaust piping, air and oiling systems and oil and water purifying systems, respectively. The ninth chapter gives the method of classifying the piping details, which are divided into 22 groups, all having separate chapters. A complete index is appended.

Energy.—By Sidney A. Reeve. Cloth bound. Size 6¼ x 9½ in.; 238 pages; 12 diagrams. Price \$2 net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York City.

The book deals with work, heat and transformations and is merely an effort to fit together the Newtonian mechanics, the doctrine that heat is a mode of motion, and a dozen or more well known facts of thermal action, into a consistent whole, which may serve as an engineer's idea of heat and heat-action. It was originally prepared for publication in the technical periodicals, and some of the earlier portions appeared in preliminary form in the columns of *The Engineer* (London).

The first six of the 16 chapters are devoted to energy, while the next six are given up to heat and mechanical concepts of thermal phenomena. Transformations of energy are covered in the last four chapters, which include the energetic cycle, reversed and irregular cycles, and thermal equilibrium.

The plant of the Griffin Car Wheel Company, Denver, Colo., which was destroyed by fire some time ago, is being rebuilt.

Judgment for \$2000 Against Picketing Strikers.

In giving a decision making permanent the injunction against the striking molders of the Berry Foundry & Mfg. Company, St. Joseph, Mo., as noted in *The Iron Age* of March 31, 1910, page 754, the Circuit Court reserved the question of the amount of damages. The company had asked for \$10,000. In the past week the court's order has been put on record. It awards \$2000 damages against the International Molders' Union of North America, local union No. 138 and various members of the latter who are named in the complaint. How the judgment will be collected is not indicated. Both the national organization and the local have funds on hand and some of the strikers own real estate. Such an award in an injunction case is rare if not unprecedented. The molders have not appealed the case, but as a preliminary step a motion has been filed for a new trial.

The Ingersoll-Rand Company.

The Ingersoll-Rand Company has issued its report of financial results for the year ended December 31, 1909, which compares as follows:

	1909.	1908.
Net earnings.....	\$1,231,346	\$891,638
Depreciation	426,780	444,733
Balance.....	\$804,566	\$446,905
Interest on bonds.....	100,000	97,982
Balance for dividends.....	\$704,566	\$348,923
Preferred dividends.....	287,988	284,808
Surplus for year.....	\$416,578	\$64,115
Previous surplus.....	984,747	920,632
Profit and loss surplus.....	\$1,401,325	\$984,747

An initial dividend at the rate of 5 per cent. per annum has been declared on the common stock of \$3,000,000.

The Crocker-Wheeler Company, Ampere, N. J., has recently booked a large number of orders for direct current apparatus, among which are the following: One 250-kw. engine type generator to the Pope Tin Company, Steubenville, Ohio; one 250-kw. generator to Ames Iron Works of Pennsylvania; one 500-kw. engine type generator to the Youngstown Iron & Steel Roofing Company; two 75-hp. and one 10-hp. rolling mill motor, sold to the Indiana Steel Company, for operating screw straightener; six 15-hp. and four 100-hp. motors to the Spanish-American Iron Company of Cuba; one 100-hp. motor to the John A. Roebling Sons Company, New Jersey; two 75-hp.; two 50-hp. and two 15-hp. series wound rolling mill motors to the Alliance Machine Company of Ohio; one 20-hp., one 15-hp., two 10-hp. and one 5-hp. motor to the H. J. Ruesch Machine Company of New Jersey; one 250-kva. engine type alternating current generator to the International Silver Company of Connecticut; two 500-kw. motor generator sets to the Carnegie Steel Company.

The Hyde Park Foundry & Machine Company, Hyde Park, Pa., is about to build an addition to its pattern shop that will double its capacity. In its machine shop it recently installed a 50 in. x 16 ft. machine lathe and a 5-ft. slotter, and will shortly add a 44-in. roll lathe of its own make. The plant is operating to capacity, which will be maintained for some months on the following: For the McKeesport Tin Plate Company, McKeesport, Pa., one 44-in. roll lathe, rolls and miscellaneous mill castings; Seneca Iron & Steel Company, Buffalo, N. Y., one 28-in. hot mill complete with rolls; Carnahan Sheet & Tin Plate Company, Canton, Ohio, one complete 28-in. hot mill and two cold mills; American Sheet & Tin Plate Company, mill housings for its different plants, besides other contracts for mill castings for various iron and steel works.

Judicial Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

Liability of Connecting Railroads Concerning Freight.—Where property is delivered to a railroad company to be transported by it and another company over their respective roads to its place of destination, it is enough for the owner, in an action against the delivering company to recover damages for negligence, to show that he delivered the property to the first company in good order, and the burden is then cast upon the company delivering the goods thus damaged of showing that they were not injured while in its possession, or that they came to its possession thus injured. (New York Supreme Court, Trial Term, Erie County, *Blount vs. Pennsylvania Railroad Company*, 119 New York Supplement, 65.)

Freight.—Bill of Lading or Prepayment of Charges Not Necessary.—When goods are delivered to and accepted by a railway company for transportation, no bill of lading or prepayment of freight is necessary in the absence of law or notice to the shipper that such is required by the rules of the company. (Maine Supreme Judicial Court, *Lord vs. Maine Central Railroad Company*, 74 Atlantic Reporter, 117.)

Railroad Shipment Contract.—Damages.—Railroad companies may by special contract require claims for damages to be presented within a given time provided the time allowed be reasonable; and such provision is not a condition by which the liability of the carrier is restricted, nor a limitation of the time within which an action may be brought to recover damages for negligence or breach of contract. (North Carolina Supreme Court, *Austin-Stephenson Company vs. Southern Railway Company*, 65 Southeastern Reporter, 757.)

Liability of Carriers of Freight.—A railroad company is an insurer of freight delivered to it for carriage, and can only escape liability for loss or damage by showing it was caused by an act of God, or the public enemy, or by inherent defects in the goods. A warehouseman is not an insurer of goods placed in his warehouse, and is only liable for such loss or damage thereto as is caused by his negligence or failure to exercise ordinary care. The duty of a carrier does not end by merely carrying the goods in its cars to the point of destination, but it must deliver them at such place in or about its station as will enable the consignee to conveniently get them. The period of reasonable time for the removal of goods begins when the consignee knows, or, in the exercise of reasonable diligence should know, that they have arrived. (Kentucky Court of Appeals, *Lewis vs. Louisville & Nashville Railroad Company*, 122 Southwestern Reporter, 184.)

Authority of Seller of Goods Respecting Shipment.—A seller who, without receiving specific instructions as to shipment, ships the goods by express addressed to the buyer, must show either express or implied authority to enter into a contract with the carrier, limiting its liability in case of loss, and such authority is not implied from the mere direction of a new customer to ship by express. (Kansas City Court of Appeals, *Missouri, Lewis vs. Imhof et al.*, 122 Southwestern Reporter, 329.)

Liability of Carrier of Freight.—A clause in a bill of lading, exempting the carrier from liability for loss "by floods or by fire," limits the carrier's liability to negligence. Where freight is damaged by fire, the owner, in order to recover from the carrier, must show that the fire was caused by the carrier's negligence. (New York Supreme Court, Appellate Division, First Department, *Burke vs. Erie Railroad Company*, 119 New York Supplement 300.)

Failure of Railroad Company to Deliver Freight.—Liability for Special Damages.—Where a consignee paid the freight charges on a car of coke in the railroad company's yards at the point of destination, informing the company that the consignee's coke supply was running short, and that unless the shipment was received promptly the consignee's plant would likely be shut down, special damages caused by a loss of business could be recovered on account of the railroad company's failure to deliver the shipment, but the consignee could not recover for loss of an order for work, where it appeared that the order was afterward filled, and that all the profit was made out of it that would have been made had it been filled promptly. Generally the measure of damages for wrongful conversion of property is its market value at the time and place of conversion. Proof of the price paid for property is not evidence of its market value. (Texas Court of Civil Appeals, *Texarkana & Fort Smith Railway Company vs. Neches Iron Works*, 122 Southwestern Reporter 64.)

Rights of Consignee Acting as Agent.—A consignee of freight has no cause of action against a railroad company for failure to deliver goods consigned for sale by him as agent of the consignor; the title being in the consignor. (South Carolina Supreme Court, *Grant vs. Southern Railway Company*, 65 Southeastern 1022.)

Pioneer Patents.—A pioneer patent is one which first

discloses means to accomplish a certain result, and the term does not apply to a patent for new means to accomplish a result already attained in another way, although they may be an improvement on the old way. (United States Circuit Court of Appeals, Sixth Circuit, *National Dump Car Company vs. Ralston Steel Car Company*, 172 Federal Reporter 393.)

Combination of Old Elements Patentable.—To constitute a patentable combination of old elements, they must by their joint action produce a new and useful result, or an old result in a cheaper or otherwise more advantageous way. (United States District Court, Northern Division of Alabama, Southern Division, *Gaines vs. Alabama Consol. Coal & Iron Company*, 173 Federal Reporter 303.)

Elements of Unfair Competition Subject to Injunction.—Unfair competition subject to injunction does not necessarily involve the violation of any exclusive right to the use of a word, mark or symbol as it may arise from the use of words, &c., which everybody may use; the test being whether what has been done tends to pass off the goods of one for those of another, or to deprive such other of his rights. (United States Circuit Court, District of New Jersey, *Bates Mfg. Company vs. Bates Numbering Machine Company*, 172 Federal Reporter, 892.)

Patents.—Construction of Claims.—Radiators.—Where terms which are not technical terms of the art are used in the claims of a patent to differentiate between different tubes in the patented structure, the specification may be referred to for the purpose of ascertaining their meaning as so used. The Fowler patent, No. 609,800, for a radiator, narrowly construed as required by the prior art, held not infringed. (United States Circuit Court of Appeals, Third Circuit, *Fowler & Wolfe Mfg. Company vs. National Radiator Company*, 172 Federal Reporter, 661.)

Patents.—Infringement.—Water Motors.—Under the United States statute which provides that a reissue patent shall have the same effect and operation in law as if the same had been originally filed in such corrected form, those who use or sell after the date of the reissue patent articles covered thereby become infringers, although they had lawfully sold them prior to the reissue by reason of an omission which was thereby corrected. The Coffield reissue patent, No. 12,719 (original No. 806,779), for a water motor, held valid and infringed on a motion for a preliminary injunction. (United States Circuit Court, Northern District of Virginia, *Coffield Motor Washer Company vs. A. D. Howe Company*, 172 Federal Reporter, 668.)

Duration of Trademarks.—Sales of Good Will.—Where the words "Marshall perfecting engine" were used merely to designate an engine manufactured under a patent granted to defendant, and not as a trade name, the exclusive right to the use of the words ceased on the expiration of the patent. No competing business can be set up in derogation of the grant of the good will of a business upon its sale, and whether a business subsequently established by the seller does so depends upon the extent of the business sold. A covenant not to engage in a particular business, upon its sale, is valid, even if unlimited as to time and place, if it is necessary to protect the purchaser. (Massachusetts Supreme Judicial Court, *Marshall Engine Company vs. New Marshall Engine Company*, 89 Northeastern Reporter, 548.)

Effect of Invalid Patent.—An invalid patent can create no rights in favor of the patentee against one who in no way recognizes its validity or a license to use it. (Iowa Supreme Court, *Ross vs. Dowden Mfg. Company*, 123 Northwestern Reporter, 182.)

Infringement of Patents.—Improved Devices.—Infringement of a patent is not avoided by improvements on the patented device, although they may be patentable, which do not affect the principle of operation, function of the parts or results obtained. (United States Circuit Court, Southern District of New York, *Corrington vs. Westinghouse Air Brake Company*, 173 Federal Reporter, 69.)

Caution.—George G. Blackwell Sons & Co., Ltd., Liverpool, England, state that an individual appears to be going about the United States, alleging that his name is G. E. Blackwell or G. H. Blackwell, and that he is a member of the above named firm, and has succeeded in obtaining money on this statement. The man in question has no connection with the firm whatever, or with the Blackwell family, and further than this he is quite unknown to the members of the firm.

The Union Gas & Electric Company, Cincinnati, Ohio, is stated to have placed an order for 2500 tons of large sized cast iron pipe for a natural gas line. This order comes as an innovation in the trade, as the natural gas interests have for years used steel or wrought iron pipe for line purposes.

Trade Publications.

Lifting Magnets.—Cutler-Hammer Clutch Company, Milwaukee, Wis. Folder. Illustrations and descriptive matter explain the operation of the Cutler-Hammer lifting magnet, which contains a number of improvements, such as the elimination of eye-bolts and the substitution of lugs cast integral with the magnet frame, the impregnation of the coil to protect it from the effects of moisture and the winding of the coil on a metal spool to facilitate its removal from the magnet frame when necessary. The spool used in these magnets is of steel and forms a part of the inner pole and the terminal block is attached thereon.

Machinery.—The Adams Company, Dubuque, Iowa. Seven circulars. Illustrate and describe a number of different machines, including the Farwell squeezers, universal molding machines, milling attachment and automatic gear hobber and the Adams snap flasks and grinders. An illustrated description of the gear hobber was printed in *The Iron Age* June 4, 1908.

Copper-Clad Steel Wire.—The Duplex Metals Company, 149 Broadway, New York. Booklet. Contains a description of the office and the mill where the wire is drawn. Both of these are supplemented by illustrations, the former showing the view from the office in a number of directions and the latter how the 6-in. square ingots are converted into copper-clad wire.

Bearings.—George V. Cresson Company, Philadelphia and New York (90 West street). Calendar for March. Illustrates the Cresson Philadelphia hanger, which possesses vertical and horizontal adjustment and has a split frame with fractured lock joint. The hanger is fitted with a ring-oiling, babbitted bearing with either plain or collar end.

Screw Thread Limit Gauges.—Wells Bros. Company, Greenfield, Mass. Catalogue. Treats of the Little Giant limit gauges for screw threads. These gauges consist of a U-shaped frame with two pairs of working points carried at the end for giving maximum and minimum limits of size. These working points can be removed and ground when worn, and it is stated that the gauges are accurate to within 1-10000 of the exact size. Two styles of gauges, the external limit and the plug, are made for all sizes of United States standard thread from $\frac{1}{4}$ in. in diameter and 20 threads per inch to 2 in. in diameter and $4\frac{1}{2}$ threads per inch.

Portable Telephones.—Rawles-Cobb Company, Inc., 74 Pearl street, Boston, Mass. Circular. Relates to a portable telephone for use in factories, mills, railroads and other noisy places. This instrument combines the receiver and transmitter in such a way that both hands are left free and may be employed for other purposes while using this device.

Contractors' Supplies.—Boston Bolt & Iron Company, 40 Farnsworth street, Boston, Mass. Circular. Deals with a number of different pieces of heavy hardware and contractors' supplies, such as expansion bolts, timber dogs, anchor irons and wall ties, pipe hooks and rolls, washers, belt clamps, screws, hinges, joist hangers, wedge bolts and truss and tie rods.

Electrical Appliances.—Fort Wayne Electric Works, Fort Wayne, Ind. Two bulletins and a booklet. No. 1118, superseding No. 1096, is concerned with the type A transformer, which is designed to operate from 2200 volts to 990 on the primary and 110 and 220 on the secondary, the frequency limits being 50 to 140 cycles, with a normal frequency of 60. No. 1119 contains a description of the Northern type B direct-current motors. The complete line comprises 15 frames, which afford a great variety of ratings both for constant and variable speeds and for continuous or intermittent service. The booklet refers to the Paul pump, which is intended for individual water supply systems. These pumps are double-acting piston pumps and are driven by direct-connected electric motors operating at 1700 rev. per min.

Lathe Chucks.—Onelda National Chuck Company, Onelda, N. Y. Circular. Points out the advantages of the steel reinforced independent lathe chuck, an illustrated description of which was printed in *The Iron Age* February 3, 1910. This chuck has a cast iron body with steel operating screws and jaws and a heavy forged steel reinforcing ring, which it is claimed prevents the chuck from breaking and relieves the body of the stress which bears directly upon it in other makes of independent chucks.

Machine Shop Appliances.—The Cincinnati Iron & Steel Company, Cincinnati, Ohio. Three circulars. The first is devoted to a portable floor crane, having a lifting capacity varying from 3000 to 8000 lb. The second calls attention to the Cisco hand power punches and shears, in which the roller in the lever travels through a recess in the arm, thus increasing the leverage as the roller approaches the end of the arm. The third illustrates and describes hoist holders for use on wooden or iron beams made in four sizes and varying in capacity from 500 to 3000 lb.

Chains.—Standard Chain Company, Pittsburgh, Pa. Catalogue; size $7\frac{1}{2}$ x 10 $\frac{1}{2}$ in.; pages, 122. Pertains to the line of chains manufactured by this company in its several plants. The illustrations include exterior and interior views of the plants

as well as the lines manufactured. These include dredge chain, conveyer or sprocket wheel chain, derrick chain, car brake chain and railroad chain, mine car couplings, repair links and ring dogs.

Taps and Dies.—Winter Bros. Company, Wrentham, Mass. Catalogue No. 5. Describes the Thistle brand of taps, dies and die stocks. The styles of taps made include machinists' hand taps, machine or nut taps, machine screw taps, pulley taps, stay bolt taps and pipe taps and reamers. The dies include the adjustable round, solid square and spring screw-threading types. If desired these taps and dies can be furnished to cut threads for any of the ordinary standards.

Bearing Metals.—A. Allan & Son, 486 Greenwich street, New York City. Pamphlet. Contains a reprint from the February, 1910, issue of the *Metal Industry* of an article by Andrew Allan, Jr., on "The Patent Controversy Over Bearing Metals." It is a continued discussion regarding copper-tin-lead alloys and deals with the use of Allan bearing metals. The illustrations include photo-micrographs of a number of bearing metals.

Boiler Tube Cleaners.—Lagonda Mfg. Company, Springfield, Ohio. Catalogue K. Discusses the construction and use of the Weinland quick repair head, an illustrated description of which was printed in *The Iron Age* March 17, 1910. The principal advantage claimed for this device is that the cutter heads can be easily removed and renewed as often as may be required.

Tie Plates and Spikes.—The Hart Steel Company, Elyria, Ohio. Catalogue No. 4. Shows the McKee line of tie plates, which are made in several types of plain and shoulder plates both with flat bottoms and with longitudinal and transverse flanges, as well as the latest types of screw spike plates. Space is given to the ordinary type of spikes and a list of points to be covered in ordering tie plates is included.

Tool Steel.—Firth-Sterling Steel Company, E. S. Jackman & Co., agents, 710 Lake street, Chicago, Ill. Booklet; size $3\frac{1}{4}$ x $5\frac{1}{2}$ in.; 28 pages. Covers the Firth-Sterling line of steels for chisels; machine shop tools; blacksmith tools; punches and dies; boiler shop tools; shear blades; rivet sets, snaps and dies; machine parts; roll turning tools; stone quarries and mills; and mining drills. Tables of weights of flat, octagon, round and square steel bars are appended.

Interior Lighting.—General Electric Company, Schenectady, N. Y. Two pamphlets. No. 3907 illustrates and describes the G. E. Mazda lamp, the latest development in the field of high efficiency metallic filament lamps. No. 3894 treats of building lighting and refers to a number of installations of tantalum and tungsten filament lamps. Data on the value of high efficiency lamps in private lighting plants is appended.

Alumaloyd Sheets.—The Stark Rolling Mill Company, Canton, Ohio. Folder. Deals with alumaloyd sheets for automobile bodies and parts. These sheets, it is claimed, give a perfect, lasting and rust-resisting finish to the parts of automobiles where they are used.

Arc Lamp.—The Adams-Bagnall Electric Company, Cleveland, Ohio. Bulletin No. 85, superseding No. 79, is concerned with the A. B. regenerative flame arc lamp which is designed to produce a flame of high luminous efficiency. The light is produced by the introduction of various chemicals into the carbons which become vaporized by the heat of the arc and possess the property of penetrating fog, smoke or dust, thus making their installation in railroad yards or mills very advantageous. The carbons used in this lamp are of a special type, and are placed one above the other. The lower one consists of a star shaped core center, with the radial spaces or grooves filled with a chemical composition that possesses the property of maintaining an orange ray independently of the presence of oxygen. As this substance is made gaseous by the heat of the arc it ascends in the inner globe and passes through two side tubes to the bottom, where it becomes reheated by the arc and repeats the circle of operation. The chemicals are thus used over and over again, intensifying the light and giving rise to the name regenerative. This lamp was described in *The Iron Age* October 7, 1909.

Gravity Underfeed Stokers.—American Ship Windlass Company, Providence, R. I., Lehner Engineering Company, Singer Building, New York City, agents. Pamphlet; size 6 x 9 in.; 24 pages. Relates to a series of tests made on boilers equipped with the Taylor gravity underfeed stokers, by consulting engineers or by the owners of the plants. Three tests are especially worthy of mention: Those of the National Museum Building, Washington, D. C., and Fox River Paper Company, Appleton, Wis., where the amount of water evaporated per pound of combustible was exceptionally high, and that of the Waterside station of the New York Edison Company, where the load varied from 125.8 to 191.7 per cent. of the rated capacity of the boilers.

Electric Cranes.—Alliance Machine Company, Alliance, Ohio. Catalogue; size 8 x 11 in.; 84 pages. Pertains to a line of large conveying and handling machinery, such as electric traveling cranes, charging and drawing machines, soaking pit cranes, strippers, hydraulic machinery, riveters, rolling mill machinery, steel cars, steam hammers and copper converting machinery. A number of notable installations of this machinery are illustrated

and a long list of installations with their location and capacity is appended.

Foundry Machinery and Equipment.—Northern Engineering Works, Detroit, Mich. Booklet No. 93. A reminder of the different foundry appliances manufactured by this firm and which are described at greater length in its catalogues and bulletins. Among the appliances illustrated are the Keep sectional cupola and the type C electric holst, illustrated descriptions of which were printed in *The Iron Age* August 31, 1903, and June 18, 1908, respectively.

Gasoline Motor Cars.—American Locomotive Company, 1886 Broadway, New York City. Catalogue. Treats of the Alco line of gasoline motor cars, which consists of four and six cylinder touring cars, two four-cylinder town car models and a four-cylinder truck having a capacity of 3 tons. The special features of these cars are illustrated and described at some length.

Vacuum Cleaners.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 170. Illustrations and descriptive matter explain the operation of the Sturtevant motor-driven vacuum cleaner. This machine is composed of a light aluminum fan and case connected to a dust separator, and the fan is driven by a direct-connected motor operating from a lighting circuit. The special features of this cleaner are light weight, small space, a suction capacity of nearly 100,000 cu. in. of air per minute, and a working radius of 32 ft. from the lighting socket to which the motor is attached. The capacity of the dust collector is also very large.

Engineering Specialties.—Nason Mfg. Company, 71 Fulton street, New York. A new monthly publication entitled the *Angler*. Each issue is to illustrate some new or specially meritorious device. The April issue presents the new Vesuvius steam trap. The company states that it is now rounding out its seventieth year as a builder of steam traps.

New Wilmarth & Morman Grinding Machinery.

Because of the increasing use of alternating current for power purposes, the Wilmarth & Morman Company, Grand Rapids, Mich., has developed an electrically driven drill grinder to operate on this kind of current. It is of the fully self-contained type corresponding to the direct current machine made by the company and will shortly be placed on the market.

The Iowa Electrical & Machinery Company, Waterloo, Ia., will conduct a general supply business in street lighting fixtures, street railroad, telephone, telegraph and electric lighting material, mill supplies and electric motors. The company will represent several well known machinery houses, and has secured the exclusive agency of the Philadelphia Electrical & Mfg. Company's line for Iowa, Minnesota, Wisconsin, the Dakotas and Nebraska. R. H. Manwaring, formerly of Philadelphia, Pa., who has had 10 years' practical experience in the supply business, is general manager of the company.

Thomas A. Fernley, secretary of the National Association of Jobbers of Wrought Pipe and Fittings, 505 Commerce street, Philadelphia, Pa., has prepared for distribution a pamphlet entitled "Price Maintenance." This treats of the question in its different phases, but more especially as it relates to the control of resale prices of manufacturers. The pamphlet has been issued to meet the demand for information relative to restricted price schedules and different modes of enforcing them.

The International Harvester Company, Chicago, has acquired during the past year a considerable acreage of coal lands in Harlan County, Kentucky, and will build 300 coke ovens, which it is understood will be of the by-product type. This plant will be on Big Loony Creek, in a district where there have been no shipping facilities, but a railroad which is being extended into this territory will afford the necessary outlet.

The Meehan Boiler Company, Lowellville, Ohio, has the contract for rebuilding Sarah Furnace of the Kelly Nail & Iron Company at Ironton, Ohio, which will soon blow out for this purpose, after a long run.

New York and New Jersey Hardware and Iron Association's Banquet.

On the evening of April 2 the eleventh annual banquet of the New York and New Jersey Hardware and Iron Association was held at the Café de l'Opera, New York City, and proved to be among one of the most enjoyable of its social meetings. The dining tables, which were arranged in the shape of the letter H, representing hardware, accommodated about 40 persons. A. S. Van Sant, W. T. Crane Carriage Hardware Company, Newark, N. J., president of the association, proved an efficient toastmaster, and cordially welcomed the members and guests, among whom were a number of manufacturers. Charles C. Lewis, Chas. C. Lewis Company, Springfield, Mass., a member of the Heavy Hardware Committee of the National Hardware Association, made a forcible address, explaining the benefits that accrue to the heavy hardware associations from being represented in the National Association.

The active membership of the association includes John C. Bonn, H. F. Gundrum Company, G. H. Kennedy & Co., William E. Kleine & Co., New York Iron Store Company, E. C. Striffler, N. Langer & Sons, Joseph Ruppert, Ruwe Brothers, C. H. Tiebout & Sons, W. T. Crane Carriage Hardware Company, J. G. Merkel Company, George J. Hollerith & Co., Doremus & Snyder and Quackenbush & Son. A. S. Van Sant is president, J. T. Doremus vice-president, Henry Bodevin treasurer, Edw. C. Striffler secretary and Charles A. Hauck corresponding secretary.

Among the guests present at the banquet were Frank Hall, American Screw Company; J. E. Good, American Iron & Steel Mfg. Company; P. S. Dyer and C. S. Rees, American Horseshoe Company; L. D. Morris, Cambria Steel Company; R. T. Badgley, Consolidated Hoof Pad Company; W. Darlington, Hoopes Bros. & Darlington; W. J. Kent, Revere Rubber Company; William Lauer, Lambertsville Spoke Mfg. Company; J. D. Ahern, Morgan & Wright; J. D. Keith, Phoenix Horseshoe Company; R. B. Cook and W. S. Comly, Russell, Burdsall & Ward Bolt & Nut Company; I. S. Ventres, Union Nut & Bolt Company; F. W. Wurster, Jr., F. W. Wurster & Co.; A. Bostwick, Union Forging Company; Edward McCarty, J. C. McCarty & Co.; Charles C. Lewis, Charles C. Lewis Company.

C. T. Alden, electrical engineer, has become interested in J. B. Taylor & Co., Inc., engineers, 37 Liberty street, New York, and is now their chief engineer and general manager. It is understood that he will reorganize the business and enlarge it, making an engineering and operating company, taking up electric and steam railroads, gas, water power, irrigation and other propositions, reorganizing, building, &c.

The new bridge being built across the Ohio River at Beaver, Pa., for the Pittsburgh & Lake Erie Railroad by the McClintic-Marshall Construction Company, Pittsburgh, has been connected up. It is of the cantilever type and the steel work is 1799 ft. in length. The bridge is one of the largest of its kind in the country, and it is expected that the first train will pass over it some time this month.

The National Railways of Mexico recently closed a contract with the Monterey Iron & Steel Company, Monterey, Mexico, for \$2,000,000 worth of steel rails and structural bridge material.

The Bessemer & Lake Erie Railroad has placed an order with the Carnegie Steel Company for 114,000 steel ties which will be rolled at the Homestead Steel Works.

THE MACHINERY MARKETS.

An improvement has been noted in the East as far as machine tools are concerned. New England dealers carrying both supplies and machine tools report that March was the largest month in their history, the chief gain being on the machinery end, though that portion of their business has not reached the record point. New England buying is considerably brisker than it has been. In territory contiguous to Milwaukee and Detroit the machine tool business seems to be particularly good, orders from the automobile industry predominating. Pittsburgh reports general conditions satisfactory, with much interest taken in the export trade, particularly that with Mexico. In Chicago there is an improvement in all lines. Throughout the South and West power and electrical equipment seems to be more in demand than in any other section. With the exception of the small number of orders received from the railroads, the general machinery situation all over the country is encouraging. The Boston Elevated Railway Company has out a considerable list of machinery, both metal and woodworking. The Maxwell-Briscoe Motor Company, Providence, R. I., has out a machinery list, totaling close to \$50,000 worth of tools. The largest contract for mining and ore reduction machinery let since the panic has been closed by the Allis-Chalmers Company, Milwaukee, Wis., with a Brussels company. The contract covers the entire equipment of the crushing, concentrating and smelting apparatus for a copper ore crushing plant of 900,000 tons yearly capacity and includes the power and electrical machinery. The plant will be built near Lake Tanganyika in the Congo territory of Central Africa.

New York.

NEW YORK, April 6, 1910.

As far as business booked is concerned, an improvement over the previous week can be noted in the machine tool line. Orders continue to be mostly for single tools, and milling machines appear to be especially in demand. One large firm in particular is unable to promise deliveries earlier than August or September. Large units of power plant equipment are not much in demand, although a number of small boilers and engines are being sold. Municipal improvements in the smaller cities near New York bring out a number of inquiries for electrical and water works equipment, and as the summer season approaches business from these sources will increase. Some machine tool business is still being received from the automobile trade. Where the expansion of this particular industry will lead to is more than can be predicted at the present time. With an eye to the future, wise manufacturers are now building automobiles with the chassis and motors arranged so that the cars can be converted into commercial trucks if desired.

Interest in the railroad situation is not as intense as it was a month ago. No one can intelligently predict when the railroads will come into the market. It has been known for some time that they are badly in need of shop equipment and it is also understood that extensive lists have been made up by the mechanical departments, but the executive heads are still holding back appropriations, due probably to the fear of adverse legislation at Washington. It is to be hoped that when the roads do commence buying in earnest they will not act simultaneously and swamp the trade with rush orders and thus get held up on deliveries. The long expected New York Central list, which is undoubtedly a large one, has not yet been given out. Some few single tools, however, have lately been purchased by that road.

Export business now is naturally quiet. The sugar machinery people are sending out their traveling men to Spanish America and on account of the excellent cane crop which has just been taken off they anticipate quite a run of orders later on. One prominent feature of the export situation is the interest taken in possibilities of the Canadian field, which was aroused by the recent tariff discussion. Manufacturers who, in years past, were wont to overlook that territory are now establishing branch offices and factories at central points in the Dominion. This movement is not confined wholly to the timber cutting and agricultural people.

The American Saw Mill Machinery Company, Hacketts-town, N. J., whose metropolitan and export offices are at 50 Church street, New York, has plans under way for an addition to its factory. The company is also figuring on establishing a branch plant at some point in Canada in order to take care of its increasing business from that country. No details are as yet available regarding this latter proposition.

Bids for the equipment of the water works to be built at Syracuse, N. Y., will be taken shortly, as the plans are practically complete. An electric power and lighting station is also to be erected.

The Tuttle Motor Company, Canastota, N. Y., has been recently incorporated and will erect a storehouse, office building, foundry and machine shop. The main building will be 40 x 180 ft., with an L 40 x 86 ft. The company will manu-

facture automobile, marine and stationary gasoline engines and takes over the old business of the D. M. Tuttle Company. It will require considerable more machinery, including cylinder boring machines and grinders, milling machines, &c. D. M. Tuttle is president; J. S. Munro, vice-president; S. E. Brown, secretary and treasurer.

The Bush Terminal Company, 100 Broad street, New York, has plans prepared for two additional buildings to be erected in Brooklyn, each 75 x 700 ft., six stories, of reinforced concrete construction. These buildings are to be leased for general manufacturing purposes, but information as to the prospective occupants is not available at the present time.

Considerable new machinery will probably be provided for this spring at Rochester, N. Y., for the contemplated enlargement of the water works system. Definite action has not yet been taken.

The New Egypt Light, Heat & Water Company, New Egypt, N. J., has been incorporated, with \$30,000 capital stock, and intends erecting an electric light plant. A 50-hp. engine and a generator for 500 lights will be required. The company wishes to install a gas producer or crude oil burning outfit. George L. Shinn is president.

Charles Mundt & Sons, who three years ago moved their factory from New York to Jersey City, are again enlarging their plant by the addition of three new perforating presses. The company recently put on the market a producer gas plant which has given excellent results as a power medium.

The Aldrich Mfg. Company, Buffalo, N. Y., is putting up a reinforced concrete building, 40 x 80 ft., two stories, and will add two additional stories later on. The building is to be used for a buffing and polishing department and the company is in the market for a dynamo and polishing lathes.

The Wilmot Engineering Company, Hazleton, Pa., has leased a foundry at that point formerly operated by the Harleigh Iron Works. It is probable that some new equipment will be installed.

The Spargo Wire Cloth Company, Rome, N. Y., which was incorporated 14 months ago, is doubling the present capacity of its plant. Forty more looms will be added to its equipment, making 80 in all. These are all driven by electric motors.

The Naird Linoleum Company, Newark, N. J., has let contract to the Salmond Brothers Company, Arlington, N. J., for a new factory which is to be erected on a site acquired in East Newark.

Mechanical filters and a sewage disposal plant will be provided at Geneva, N. Y. An engineer in Boston has been intrusted with the preliminary work.

The Syracuse Safe Company, Syracuse, N. Y., whose plans for a new plant have previously been alluded to, is arranging to have all machinery driven by electric motors. The building will be 65 x 300 ft., with clear headroom and served by electric crane.

The Anchor Mfg. Company has been incorporated at Crawford, N. J., to operate a plant for the production of patented specialties used in machine shop equipment.

The Maxwell Metal Reduction Company, Long Island City, N. Y., has had plans drawn for a building 40 x 90 ft., the equipment of which is to be bought this month.

Improvement of the water works system, involving purchase of considerable new equipment, is under consideration at Lestershire, N. Y.

J. E. Mergott Company has had plans drawn for a factory at Newark, N. J., for which a steam electric plant of

125 to 150 hp., including boiler, heater, pumps, engine, generator, switchboard, &c., will be needed.

Machinery will be bought this spring or early in the summer for the municipal pumping plant and water distribution system to be constructed at Fort Erie, N. Y.

Plans have been drawn for the A. L. Swett Electric Light & Power Company, Albion, N. Y., for a public service plant of 750 kw. capacity, to be erected before autumn.

An automatic high speed engine, with dynamo direct connected, also air compressor and electric control apparatus, will be purchased by the city of Buffalo, N. Y., for a new building designed by Architect Howard L. Beck of that place. Bids will be taken up to April 11.

Low lift pumps and a mechanical filtration plant of 25,000,000 to 30,000,000 gal. daily capacity will be required at Trenton, N. J. Purchase of machinery is not to be made, however, until after the plans have been carefully worked out and considered.

The Davis Foundry Company has been organized at Edgewater, N. J.

Funds have been provided at Spencerport, N. Y., for a pumping plant and complete water works system. Bids covering the machinery needed will be called for shortly.

C. G. Ogden, Albany, N. Y., has drawn plans for a four-story factory building, 90 x 100 ft., to be erected by the Albany Embossing Company. Motor drive will be used.

The Municipal Heating Company, Syracuse, N. Y., which operates a public service plant, contemplates the installation of electric generating units, if the terms of its franchise can be expanded to cover power and lighting.

Advices from Buffalo, N. Y., state that the Simmons Saw Company of Fitchburg, Mass., and Chicago, has purchased a site at Tonawanda, just north of Buffalo, and will build an extensive branch plant there.

The Electrolytic Products Company, Buffalo, N. Y., has been incorporated, with a capital stock of \$100,000, to manufacture radiators for automobiles and other automobile accessories, and will establish a plant and equip it with special machinery, the radiators being of entirely new design. The incorporators are H. C. Steul, J. Porzel and Frank A. Abbott, 707 D. S. Morgan Building.

The American Radiator Company, Buffalo, N. Y., has let contract to the Durolithic Company, Buffalo, for an addition 73 x 192 ft. to be made to its plant at Elmwood avenue and New York Central Belt Line.

The Auburn Ignition Mfg. Company has been incorporated at Auburn, N. Y., to manufacture and deal in automobile appliances; capital stock, \$25,000; E. A. Raves, W. Franke and C. A. Franke, Auburn.

The Winans Machine Company has been incorporated at Binghamton, N. Y., with a capital of \$75,000, to manufacture machine tools, &c. The incorporators are T. J. Winans, D. M. Winans and C. J. Knapp, all of Binghamton.

Last week the Pardee Steel Works, Perth Amboy, N. J., sustained a serious loss by fire which destroyed one of its main buildings.

The Ironclad Mfg. Company, Brooklyn, N. Y., suffered a \$50,000 damage to its plant by fire March 30.

The Harper Machinery Company, 50 Church street, New York, is moving its plant from Bloomfield to Roselle Park, N. J. Some new machine tool equipment will probably be required.

Business Changes.

The Robins Belt Conveying Company, New York, has moved its offices from 50 Church street to its old quarters in the Park Row Building.

Before May 1 the Crosby Steam Gauge & Valve Company will move its New York store from 18 Dey street to 44 Dey street. The new location is in the Hudson Terminal Building and will be a decided improvement over the present quarters.

Chicago.

CHICAGO, ILL., April 4, 1910.

Chicago machinery houses report a general improvement in the business done as well as in the inquiries that are being received. Trade had been dull during the first half of March, but began to pick up about the middle of the month and each day shows a substantial improvement. Inquiries are coming from every source, thus indicating the growth of a broad market. There is a good demand for second-hand tools, but the inquiry for the highest class of new tools is even better. Buyers are showing their confidence in the future by placing orders for milling machines for delivery next winter, and second-hand millers are scarce. A good business is also being done in grinders, shapers, lathes, boring mills, drill presses, and in fact practically all lines.

There is universal complaint that the machine tool manufacturers cannot get skilled men to operate their plants at full capacity, as the automobile manufacturers took their best men during the past two years when machine tool business was light and are paying them wages which the machine tool maker cannot consider. Cases are reported in the

market where machine tool shops are only able to keep half the men they need, these complaints coming from points near the automobile centers.

It is reported in the market that the Chicago & Northwestern Railway has bought some of the machine tools for which inquiry was made recently, and it is understood that a committee of master mechanics of the Chicago, Burlington & Quincy Railroad has been in session the past week to make a final selection of machine tools and equipment for the Havelock, Neb., shops.

The American Paper Mfg. Company, Wichita, Kan., a corporation to be capitalized at \$500,000, which has been in the process of organization in that city for some time, has applied for a State charter and will build and operate a large strawboard and paper mill. The company has secured nine acres of ground on Athenian avenue in the northwestern part of the city where it will erect the following buildings: Main factory building 40 x 310 ft., straw beater room 50 x 175 ft., engine room 60 x 60 ft., boiler room 50 x 125 ft., cooked straw room, 40 x 125 ft., store room for finished products, 40 x 175 ft., 28 x 32 ft., ware rooms for scrap paper, large sheds to house 3500 tons of straw and 4000 feet of tracks and switches. When running at full capacity the plant will employ 150 men, will use 50 tons of straw per day and will turn out 40 tons of finished product every 24 hours. Plans for the buildings to be erected are now practically completed and work will commence immediately on the straw board and paper mill, and it is understood that none of the equipment to be installed has yet been purchased. The officers of the company are: Eugene A. Kelly, president and general manager; J. W. Metz, first vice-president; M. A. Rogers, second vice-president; J. W. Craig, treasurer; Dempster O. Potts, secretary; E. S. Shephard, superintendent and engineer.

The Indiana & Michigan Electric Company, South Bend, Ind., is erecting an addition to its plant at a cost of about \$50,000, a large portion of which will be expended for new equipment. Included in the new machinery to be installed will be a 500 hp. steam turbine and eight new boilers.

The Economy Engineering Company, Fulton and Jefferson streets, Chicago, is erecting a one story factory building 33 x 164 ft.

The Wire Hardware Company, Chicago, has been incorporated at \$50,000 to manufacture and deal in steel, iron and other metal goods. The following are the incorporators: Perry S. Patterson, Stuart G. Shepard and Wallace F. Kirk.

The International Smokeless Furnace Company, Chicago, has been organized with a capital stock of \$15,000 to do a general manufacturing business. The incorporators are: Otto Wundrack, Franklin H. Clark and John Sheridan.

The Chicago Wire Fabric Company, Chicago, has been incorporated by Wilbur W. Murray, William J. Flanagan and John M. Hubbard to manufacture and sell wire fence and wire fabrics.

Nicholas & Bookwalter, Chicago, have incorporated with capital stock of \$20,000 to do a general engineering and machine shop business. The incorporators are: Geo. N. Morgan, Enos Bookwalter and Thos. E. Nicholas.

Ellis & Foster, Waterloo, Ia., plumbing contractors, are erecting a new building 20 x 120 ft., which will be equipped with a motor thread cutting machine which has not yet been purchased.

The Macomb Sewer Pipe Company, Macomb, Ill., is erecting an addition to its main building 87 x 182 ft., three stories, and is in the market for necessary steam pipe for heating and electric lighting apparatus.

The Monarch Electric Light & Power Company, Chicago, has plans prepared for manufacturing a building 100 x 155 ft., six stories.

The P. H. Reddinger Company, Evansville, Ind., will erect a two story factory building 50 x 138 ft. and a one story boiler room 40 x 63 ft.

The Henry Pratt Company, Chicago, is erecting a boiler shop 100 x 120 ft. at a cost of \$15,000.

The Cribben & Sexton Company, Chicago, stove manufacturer, has awarded the contract for a new factory building 100 x 480 ft.

The Sackett Screen & Chute Company, Chicago, is erecting a new factory building 75 x 140 ft., one story, at a cost of \$10,000.

Fred C. Jorgeson, 159 Ann street, Chicago, has awarded the contract for the erection of a four-story manufacturing building at a cost of \$12,000.

D. I. Davis & Co., 315 Dearborn street, Chicago, is receiving bids on a packing plant comprising eight buildings which it is erecting for the John Morrell Company, Sioux Falls, S. D., which will be erected at a cost of about \$200,000. The company has plans in progress for a packing plant comprising cooler, slaughter house and storage house, each three stories and basement, for the Dubuque Packing Company, Dubuque, Ia., and is also revising plans for a packing plant, four stories and basement, for Louis Pfalzer & Sons, 4181 Halsted street, Chicago.

The Harrison Machine Works, Belleville, Ill., is erecting an addition to its foundry 25 x 75 ft. No new equipment will be installed at this time.

The Weller Mfg. Company, Chicago, has plans completed and will soon receive bids for the construction of the following buildings: Foundry, 100 x 200 ft., one story; machine shop, 250 x 300 ft., one story; office building, 50 x 250 ft., three stories. The building will cost about \$300,000.

The Western Stove Works, Peoria, Ill., is rebuilding its foundry which was destroyed by fire some time ago and expects to be in running order in about two weeks.

The American Seating Company, Richmond, Ind., has plans prepared and is receiving bids for the erection of an addition to its warehouse 100 x 160 ft., four stories, addition to foundry 100 x 200 ft. and a boiler house 50 x 90 ft.

The Lanther-Juergens Motor Car Company, Chicago, having outgrown its present factory, is removing to Fremont, Ohio, where it will occupy a plant which will afford increased facilities. The company will install considerable new equipment, most of which has been purchased.

C. F. Laws & Co. succeed to the steel and concrete bridge business of Wiley & Laws, Irving, Ill., and will be large buyers of material during the season.

The Illinois Sewing Machine Company, recently organized at Rockford, Ill., will be engaged there in the manufacture of the machines mentioned. Future requirements have not yet been definitely determined upon.

The authorities at Jacksonville, Ill., have under consideration the purchase of new tubular boilers, engine or turbine driven generating units for electric service and improved pumping machinery for the municipal power station.

The Rockford & Interurban Railway, Rockford, Ill., will be a heavy buyer of machine tools and other equipment for repair work, when plants recently outlined have been carried into effect. These include the building of shops in Rockford and the strengthening of facilities for this work at a plant now in service.

A new Corliss engine has been added to the plant of the Minonk Brick & Tile Company, Minonk, Ill., which will probably be compelled before the end of the year, by increase of business, to further enlarge its facilities.

A battery of water tube boilers, and two steam pumps of 3,000,000 gal. combined capacity, with heaters, feed pumps, &c., will be purchased before long by the Jeffersonville Water Company, Jeffersonville, Ill., unless it is decided to use electrically operated units, in which case the machinery requirements will be less.

A steam plant of about 2000 hp., including boilers, heater, pumps, engines, refrigerating machinery and an electric unit, will be required by the Arctic Ice Company, St. Louis, Mo., for a plant at Mill Creek Valley.

A centrifugal pump will be added to the powerhouse equipment of the Starr Mfg. Company, Carpentersville, Ill.

The Vulcan Plow Works, Evansville, Ind., will be considerably enlarged this summer and a quantity of new machinery installed. The details, however, are still to be worked out.

The Columbia Quarry Company, Millstadt, Ill., is arranging its crushing plant for a larger output, including the installation of improved elevating machinery.

The David Bradley Mfg. Company, Bradley, Ill., has purchased the plant of the Hartford Plow Company, Hartford, Wis., and will add a brass and aluminum foundry and drop forging plant. The company will continue the manufacture of farming implements and electric automobiles.

The Eagle Mfg. Company, Appleton, Wis., recently organized, will manufacture gasoline engines for plowing purposes, instead of automobiles, as contemplated.

The Hayes Pump & Planter Company, Galena, Ill., is having plans prepared by Raeder & Wood, Great Northern Building, Chicago, for the erection of additional buildings, one of which will be a gray iron foundry.

Sealed proposals will be received at the office of the constructing quartermaster, Capt. Malvern Hill Barnum, Fort Robinson, Neb., until April 11 for furnishing all material and labor for the installation of new boilers, new pump, feed water purification system, feed pump, &c.

Sealed proposals in triplicate will be received by Capt. David L. Stone, constructing quartermaster, at Fort Sill, Okla., until April 13 for installing an electric light and power plant and electric lighting system.

The city of California, Mo., H. E. Blakeman, city clerk, will receive bids until May 7 for furnishing material and labor and constructing a system of water works. Separate bids will be received, as follows: For furnishing all material and constructing a complete system of water works; furnishing cast iron pipe and special castings; furnishing hydrants and valves; furnishing all material and erecting complete a steel tower and tank of 70,000 gal. capacity on tower 100 ft. high, and two steel well towers; furnishing two deep well pumping units; furnishing and erecting, ready for operation, two 12-hp. gasoline engines, all f.o.b. cars.

The Bedford Power Company, Bedford, Ind., in accordance with the franchise granted by the city, has begun work on the dam at Williams, on White River, where a power plant is to be built. The plans include an emergency plant for use in times of high water when the main plant cannot be operated. S. A. Techer is secretary of the company.

Bids are invited by the Capital Commission of Wisconsin,

Madison, Wis., for furnishing necessary labor and material for completing the water mains in the Capitol Park and in the grounds of the capitol heat, light and power plant. This work contemplates furnishing and placing approximately 200 tons of cast iron water pipe, 4 to 10 in., and about 70 hydrants.

The Star Starter Company has been organized at Indianapolis, Ind., and incorporated with \$75,000 capital stock to manufacture automobile parts. The directors are G. G. F. Boswell and C. R. and Georgia A. Webber.

The Reed Stone Company has been incorporated at Bedford, Ind., with \$500,000 capital stock to quarry and manufacture stone. The directors are W. S. Holcombe, Richard Roberts, A. H. Dunihue, W. E. Powers and Louis Roberts.

The Woodburn Automobile Company has been organized at Shirley, Ind., and incorporated with \$50,000 capital stock to build automobiles. The directors are George Stenger, W. F. Keller and Herman Messmann.

The Muncie Gear Works has been organized at Muncie, Ind., and incorporated with \$250,000 capital stock to manufacture automobile parts. Factory buildings are being constructed. H. L. Warner is president; other directors are D. O. Skillen, G. H. Guthrie, John McPherson and F. F. McClellan.

The Elevator Safety Equipment Company, Indianapolis, Ind., has increased its capital stock from \$12,000 to \$50,000. H. W. McNaught is president.

The Waynetown Electric Light Company has been incorporated at Waynetown, Ind., with \$10,000 capital stock to furnish commercial lighting. The directors are S. C. Rowland, Thomas Lewellen and W. L. Smith.

The Farquhar Furnace Company has been incorporated at Indianapolis, Ind., with \$12,000 capital stock to manufacture furnaces. The directors are T. L. Scott, A. J. Brown and D. W. Edwards.

Philadelphia.

PHILADELPHIA, PA., April 5, 1910.

Notwithstanding local labor interruptions during March, merchants report a fair volume of business for the month, while some manufacturers had an exceptionally good run of orders during that period. April opens up quite promising, local machinery dealers particularly reporting a decidedly better volume of inquiries, while orders, although still confined largely to single tool propositions, have been more numerous and cover pretty fully the general line of tools. There has been a better inquiry from the railroads, the Pennsylvania Railroad particularly sending out inquiries for about a half dozen tools. Merchants' sales during the week have been larger than for several weeks past and negotiations under way are of a more promising nature. Several quite satisfactory propositions are said to be in sight, but not yet ready for announcement, and the trade generally looks for more active business conditions as spring opens up. Manufacturers of tools continue to report delays in deliveries on crude materials, more particularly in steel castings. Although recently completed increases in capacity at a number of plants in this territory should help the situation to some extent, the majority of the foundries are yet well booked ahead. Gray iron castings can be had more freely, and a greater volume of business is reported in a number of instances. Greater activity is to be noted at many of the tool building plants, and several are considering the increase of facilities. As a rule, deliveries are gradually hardening, which will have a tendency to increase the demand for second-hand tools, particularly where buyers are urgently in need of equipment.

The Pennsylvania Railroad has sent out inquiries for four boring mills, one 16 in. lathe and a locomotive axle drilling lathe. It is not stated as to which of its shops these tools are to go.

The Fairbanks Company has received the order to furnish the machine tool equipment for the battleship Arkansas, now building by the New York Shipbuilding Company, Camden, N. J. It includes milling machines, lathes, a shaper, grinder, drill press and other tools.

A new water works is to be erected at North East, Md. The extent of the proposed plant has not been fully decided upon, but it is expected that information will be available in a few weeks.

W. F. Shetzline, manufacturer of automobiles, Forty-second and Ludlow streets, is building a new machine shop, 54 x 92 ft. No additional tools will be required, the present equipment being sufficient for immediate requirements and will be moved into the new shop on its completion.

The Phosphor Bronze Smelting Company has taken title to property, 130 x 319 ft., at Twenty-third street and Washington avenue, adjoining its present plant. It will eventually extend its works, but has no decided plans at the present time.

A permit for the erection of the new buildings for the Reading Abattoir Company, Reading, Pa., has been granted to L. A. Rehr, of that city. The buildings include one of

three stories 112 x 120 ft.; one 40 x 40 ft., one 40 x 50 ft. and one 40 x 55 ft. The two last mentioned are to be one story.

Fels & Co., soap manufacturers, Seventy-first street and Woodland avenue, have been taking estimates on a number of tools for replacement in its machine shops.

The Porter Metal Mfg. Company, Perry Building, this city, is considering the establishment of a plant for the manufacture of its automatic weighing apparatus, of a capacity ranging from one to ten pounds. It will later engage in the building of machines for heavy weighing purposes.

The Commanding Officer, Picatinny Arsenal, Dover, N. J., will receive proposals until May 16 for furnishing supplies during the fiscal year ending June 30, 1911. Among the supplies required are rope, steel, iron, hardware, chemicals, laboratory supplies, electrical equipment and materials.

Numerous bids for the municipal dredging plant were received by the Department of Wharves, Docks and Ferries, City of Philadelphia. Tenders for boats and scows were particularly large. The Department has \$240,000 to spend for this equipment. The various bids were ordered scheduled and awards will be announced at a later date.

The Moyer Tramrail Department of the J. W. Paxson Company, Philadelphia, Pa., has closed contracts for Moyer tramrail systems for the entire plant of the United States Heater Company, Detroit, Mich., as well as for that of the Kennedy Valve Mfg. Company, Elmira, N. Y.

The Deemer Steel Company, New Castle, Pa., which recently began operations at its new steel casting plant, is constantly adding equipment to increase its capacity. Additional overhead cranes and an electrically driven trolley hoist system is now being installed. An order for a second converter has been placed, delivery of which is expected in the next few weeks.

Lieut. Col. H. M. Kendall, Treasurer U. S. Soldiers' Home, Washington, D. C., will receive proposals until April 13 for purchasing surplus engines, armatures, switchboards, steam boilers, pumps, hydraulic elevating machinery, steel tanks, fittings, piping valves, &c.

M. J. Dougherty and T. G. Bachran, both of whom were formerly connected with the W. K. Mitchell Company, Philadelphia, have formed a co-partnership under the name of Dougherty & Bachran, with offices in the North American Building, and will engage in the general steam engineering and contracting business. A temporary plant has been located at 1123 Appletree street, although they are now equipping at Sixteenth street and Washington avenue, the old location of the W. K. Mitchell Company, a modern plant for general pipe work, flanging, bending, fitting and welding by the oxy-acetylene process. The major portion of the necessary equipment for the new plant, which will be ready for occupancy about the middle of April, has already been contracted for.

There have been several interesting changes recently in the ownership and operative plans of some of the electric railroad lines in this territory. The sale of the Camden & Trenton Traction Company, which has been operated by a receiver, has been confirmed by the courts and will be operated by a reorganized company to be known as the Riverside Traction Company. Extensive improvements are said to be contemplated. The Holmesburg, Tacony & Frankford Railway Company, the Southwestern, and the Philadelphia & Chester Traction Company are still in the hands of receivers. Negotiations are pending for the purchase of several interborough and local lines in towns near this city. The Interstate Railway System has leased its lines to the Reading Transit Company, recently formed to operate electric railroads, &c., in several counties in the eastern part of the State. With these various changes come reports of extensive additions in the way of power plants and general equipment.

The Platt Can Company, Baltimore, Md., will erect an addition to its plant, 60 x 80 ft., three stories. Some metal working machinery will be required.

New boilers, engines, dynamos, motors, switchboard panels and steam plant auxiliaries will be required for an extension of the Electric Storage Battery Company's power station at its works in Philadelphia.

A battery of tubular boilers, Corliss engine, generator, motors and operating equipment will be needed for the new fabricating plant to be built by the Belmont Iron Works, Philadelphia.

Among recent orders received by the Link-Belt Company's Philadelphia plant were the following: Delaware, corrugated steel apron conveyors; Florida, tray elevators for oranges and phosphate rock handling machinery; Pennsylvania, continuous bucket elevator for crushed stone, bucket elevators and screw conveyors for handling grain, transfer car for loaded trucks, flight conveyor for marl, belt conveyors and peck carriers for crushed stone, belt and flight conveyors for bobbins, elevator and conveyor for chalk and conveying machinery for packages in department store; New York, clinker elevator, cloth roll lowerer, screw conveyors for grain and elevators and conveyors for handling ore.

The Espen-Lucas Machine Works has acquired a new plant, having purchased a two-story building, 100 x 206 ft.,

at Girard avenue and Leopard street, to which it will move its present equipment as soon as possible. The new plant will enable it to more than double its present capacity. The first floor will be used for heavy and the second floor for the lighter class of work. At a later date the company will probably be in the market for additional machine tool equipment.

Fire damaged the warehouse, machine shop and other buildings of the Nicetown Plate Washer Company, Philadelphia, April 4. The loss is estimated at \$15,000. The rolling mill was not damaged, and deliveries on washers will not be interrupted. The portions of the plant destroyed will be immediately rebuilt, and the equipment of the machine shop will largely have to be replaced.

New England.

BOSTON, MASS., April 5, 1910.

March proved to be an excellent month in the machinery and supply trades. Those dealers who handle both lines totaled the largest sales in their history. While the record was obtained chiefly on the supply end, machine tools showed the largest percentage of gain. The closing days of the month and the opening days of April brought something of a letup, and it is not believed that the good showing of March will be repeated before May, a not unusual down wave in the curve of business. Several large machine tool lists just issued contain specifications which should fatten the books of the New England builders. The steam engine trade reports plenty of orders, but low prices, competition for current business being keen. One establishment, however, with a capacity of some 70 engines a year, has been booking orders at the rate of two a week, including some large units, for several months past, deliveries having played fully as important a part as prices.

It is a notable fact that the textile manufacturers are going ahead with their extensions, and are planning still greater growth, though the cotton people are curtailing production on account of the high prices of raw materials. New Bedford, Mass., has spent \$15,000,000 on new cotton mills in 15 months, an extraordinary total, and in spite of this growth the stock in a new mill enterprise, just capitalized for \$1,000,000, was subscribed for in a few weeks. The total of new textile mill construction in the past year is estimated by competent authorities at between \$40,000,000 and \$50,000,000, figures never before approached. Of course, this is a great season for the prosperity of the mill supply business, purchases from this industry running into great figures. The new mills are no insignificant buyers of machine tools, the modern textile mill repair shop absorbing a goodly amount of equipment.

The Brown & Sharpe Mfg. Company, Providence, R. I., is rushing work on its large extension. At the present time about 4500 men are on the payroll, a number approximating that of 1907, and, with the availability of the new building, the 5000 mark promises to be reached in the near future.

The American & British Mfg. Company, Providence, R. I., has abandoned the development and manufacture of the Wilkinson steam turbine.

Additions to industrial plants recently announced include the following: The Downer-Hawes Company, Bridgeport, Conn., corsets, new factory on site just purchased, temporary structures to be erected immediately; Talcott Bros., Talcottville, Conn., addition to mill, 32 x 80 ft.; Lawton Spinning Company, Woonsocket, R. I., addition to cotton thread yarn mill to cost \$350,000, power plant to be equipped with steam turbine driven electric generators; Wallingford Company, Inc., electroplated hollow ware, addition 30 x 40 ft., three stories, for finishing and shipping department, no machinery being required.

The water rights in the Deerfield River above Shelburne Falls, Mass., have been taken on option by a syndicate identified with the Connecticut River Power Company, which operates the great hydraulic plant at Vernon, Vt., and who propose to develop the new property for power purposes. The plan is to bring the water of the Deerfield River, through a tunnel, to Shelburne Falls, where a large power station will be established. The proposition entails the sale of the water rights of the Lamson & Goodnow Mfg. Company at Shelburne Falls, the new owners guaranteeing to that company a certain amount of electric power. The Connecticut River Company is now serving a wide territory, sending large units of power as far as Worcester, Mass. So great a business has been built up that it is absolutely necessary to provide additional sources of supply. Under its contracts for power the company guarantees a supply under any conditions of water supply excepting flood, and a protracted drought would seriously tax the capacity of the present great reservoir, impelling the purchase of steam power to make up the deficit. The new station at Shelburne Falls would be of great service if used as an auxiliary to the main plant.

The Boston & Albany division of the New York Central Railroad is contemplating establishing a power plant at

Worcester, Mass., for the generation of electricity for a new union station and for other purposes.

The Baird-North Company, Providence, R. I., gold and silversmiths, will erect a new factory 75 x 200 ft. The company manufactures a part of its product and does a general jobbing business.

A. G. Jones, recently with the C. S. Mersick Company, New Haven, Conn., has gone with the Windsor Machine Company, Windsor, Vt., and will represent that company in New England.

The Reed & Prince Mfg. Company, Worcester, Mass., manufacturer of screws of all sorts, bolts, nuts and rivets, has established a department for the manufacture of small brass and bronze castings, and has also installed equipment for machining and polishing work for customers. The company is extending its product, and is now manufacturing slotting saws, standard screw gauges in sets as desired, taps and a limited line of flat drills. Plans are being made for producing a line of hardware specialties.

The G. Von Schantz Company, New Britain, Conn., has been organized to manufacture steam and electric power equipment and heating and ventilating systems. The shop will be at 59 Arch street. G. Von Schantz is the president, and Edward Bergman secretary and treasurer.

The Norton Grinding Company, Worcester, Mass., has booked an order from the General Electric Company, for its Lynn plant, for a gap grinding machine of exceptional size. It takes 114 in. between centers and swings 20 in., with 36 in. in gap. The bed is 26 ft. in length. The machine will be used for grinding generator shafts which are coupled direct to steam turbines.

The Pawtucket Electric Company, Pawtucket, R. I., has decided upon the installation of a 6000-hp. steam turbine, with alternating current generator of corresponding capacity and the usual auxiliaries.

Complete equipment for a steam turbine condensing system, including pumps, will be purchased about May 1 for the Charlestown Navy Yard at Boston, Mass.

Contract will be let after April 22 for a 6,000,000-gal. pumping engine to be installed at Watuppa, Mass., bids for the furnishing of which have already been made. Any others will be taken until then.

A factory of considerable size, which will probably be driven by individual motors on the plant adopted by the Royal Weaving Company at Pawtucket, R. I., will be erected at Northampton, Mass., by the Northampton Silk Company. Fox & Gale, Boston, are in charge of the plans.

The Maxwell-Briscoe Motor Company, Providence, R. I., and the Boston Elevated Railway Company have out machinery lists, and the Boston & Maine Railroad should announce its requirements for the new running repair shop at Somerville in the near future, as the frame of the structure is already up. Announcement has been made that the list totals about \$64,000. The building is 147 x 203 ft. and is the first unit of a great plant which, as planned, involves the expenditure of \$2,000,000.

The Maxwell-Briscoe Machinery List.

The Maxwell-Briscoe Motor Company, Providence, R. I., has sent out the following list of machine tool requirements, under date of March 31:

- One Gardam adjustable multiple four-spindle drilling machine, having 12-in. square belt feed; one ditto six-spindle; one ditto eight-spindle.
- Two Pratt & Whitney 2 x 26 in. turret lathes, arranged for 4-in. pistons, also for 4-in. piston rings, also fitted with tools for both pistons and piston rings.
- Two Pratt & Whitney No. 2 Lincoln milling machines, complete with countershaft and vise.
- Two Pratt & Whitney No. 2 hand milling machines, complete with countershaft, vise, overhanging arm, and fitted with No. 9 B. & S. taper.
- One Pratt & Whitney 2 x 26 in. new model turret lathe, complete with equipment A.
- One Pratt & Whitney 2 x 26 in. new model turret lathe, complete with equipment B.
- Three Pratt & Whitney 1½ x 18 in. new model turret lathes, complete with equipment A.
- Three Pratt & Whitney 1½ x 18 in. new model turret lathes, complete with equipment B.
- Two Pratt & Whitney 1 x 10 in. new model turret lathes, complete with equipment B.
- Two Pratt & Whitney 1 x 10 in. new model turret lathes, complete with equipment A.
- One Pratt & Whitney No. 1 two-spindle centering machine, 4 in. capacity, complete with equipment.
- One Heald ring grinder, No. 210; one Heald cylinder grinder, No. 60; one Heald internal grinder, No. 70.
- Two Norton plain grinders, 6 x 32 in.; two Norton plain grinders, 10 x 50 in.
- One Brown & Sharpe No. 2 universal grinding machine; two Brown & Sharpe No. 13 automatic gear cutting machines.
- Two Brown & Sharpe No. 3 plain milling machines, with hand transverse and vertical feeds, also pump, also with slotting attachment and cam cutting attachment.
- One Brown & Sharpe No. 2 universal milling machine; one Brown & Sharpe No. 3 surface grinding machine, 36 in.
- One Diamond No. 2 drop apron tool grinding machine, 20 x 2½ x 7 in., with wheel, countershaft, truing device with apron.
- Three Prentice Bros. engine lathes, 14 in. by 6 ft., double back geared, compound rest, complete, without quick change gear device.
- One Prentice Bros. high speed geared head lathe, with quick change device, 14 in. by 6 ft.
- Three Prentice Bros. double back geared engine lathes, 16 in. by 8 ft., without quick change gear device, with compound rest.
- One Prentice Bros. high speed geared head engine lathe, 16 in.

- by 8 ft., with quick change gear device, compound rest and taper attachment.
- Three Prentice Bros. double back geared engine lathes, 18 in. by 10 ft., without quick change gear device, with compound rest.
- One Prentice Bros. high speed geared head engine lathe, 18 in. by 10 ft., with quick change gear device, and compound rest.
- One No. 3 Becker plain horizontal milling machine, with automatic feed to the knee, also vertical milling attachment for No. 3 machine, also 12-in. cam cutting attachment; four Becker plain horizontal milling machines, all feeds automatic.
- One G. A. Gray & Co. standard planer, 36 x 36 in. by 8 ft., with one head on the cross rail, complete with countershaft.
- Two Perkins No. 5 plain power presses; two Perkins No. 7 geared power presses; one Perkins No. 9 model 1 trimming press.
- Two Baker Bros. high speed drills, with plain tables, No. 0; one Baker Bros. No. 00 keyseating machine, with full equipment.
- One Bradley cushioned helve hammer, 60 lb.; one Bement 350-lb. single frame steam hammer; one Bement Morrill Bros. 1000-lb. board lift drop hammer.
- One Nutter-Barnes No. 2 4-in. cutting-off machine, also with 20-in. automatic saw sharpener.
- One New Yankee drill grinder, style B, point, with overhead countershaft and the extra 10 x ¼ in. bevel faced wheel, complete with T-rest, &c., on rear end of spindle for finishing points of drills, capacity ¼ to 2½ in. drills.
- Two Allen single spindle sensitive drill presses; two Allen four-spindle plain bearing drills.
- Four Prentice Bros. 20-in. drill presses, power feed, back geared, wheel and lever feed, and automatic stop; two Prentice Bros. 28-in. sliding head gear feed vertical drilling machines; two Prentice Bros. 26-in. gear speed change vertical drilling machines, sliding head and fitted with tapping attachment.
- One Fay & Scott 20 x 42 in. by 8 ft. extension bed gap engine lathe; one radial drill, 36 in.
- One Springfield double semi-muffle furnace, No. 110, with all necessary brick; three Buffalo No. 00SD down draft forges, with fire pan 38 x 42 in.; one American oil separator, No. 1 and No. 2; one pipe bending machine, size 2½ in.; three diamond snagging machines, 3 x 16 wheels.
- Two ¾-in. Gridley automatics, single spindle; two Bullard rapid production vertical mills, 24 in.
- Two ¾-in. Cleveland automatic screw machines; two ¾-in. ditto; two 1¼-in. ditto; two 2-in. ditto; two Whittons gear cutters, reverse speeds.

The Boston Elevated Machinery List.

The Boston Elevated Railway Company, 101 Milk street, Boston, has issued a list of machine tool requirements, under date of April 2, as follows:

- One 2 x 24 in. flat turret lathe, with double outfit for bar and chuck work and complete outfit of tool, Jones & Lamson Company's or equal; one 20-in. engine lathe, 8-ft. bed complete, F. E. Reed Company's or equal.
- One 20-in. engine lathe, 8 or 10 ft. bed, complete equipment, with taper attachment, Hendey Machine Company's or equal; one 24-in. engine lathe, 10-ft. bed complete, with regular equipment, Hendey Machine Company's or equal; one 24-in. planer, with regular equipment, Crescent Machine Company's or equal.
- The following equipment is referred to by number in the 1909 catalogue of Manning, Maxwell & Moore, the specification being these or their equal: No. 6 wood trimmer, Fig. 13,322; No. 2 wood trimmer, Fig. 13,324; 18-in. jointer complete, Fig. 13,420; 36-in. band saw, Fig. 13,374; No. 3 universal saw bench, Fig. 13,452B; 6-in. accelerated speed cutting-off machine complete, Fig. 12,262; No. 1 keyseating machine, fully equipped; 24-in. crank shaper, Fig. 11,179.
- One 25-in. drill press, Fig. 11,963; No. 2 36 x 6 in. grindstone, with frame complete, stone suitable for grinding wood cutting tools, Fig. 13,001; patternmakers' speed lathe, 16 x 6 in., Fig. 11,706; No. 8 toolroom grinder, with countershaft complete, distance between center wheels 41 in., maximum diameter wheels 24 in., Fig. 12,962; No. 5 tool grinder, with countershaft complete, distance between wheels 20 in., for wheels 16 x 2½ by 2½ in., Fig. 12,924; steam glue heater, without joints, size B No. 3, to take 6-in. pots size 20 x 14 x 10 in. deep, Fig. 4573.
- Other tools in the list include:
- One No. 2 surface grinder, longitudinal and transverse movement combined, Brown and Sharpe's or equal; patternmakers' gap lathe, Putnam Machine Company's or equal; belt drive 24-in. planer, 6-ft. planing length, Putnam Machine Company's or equal.
- One 2-in. double bolt cutter, with complete equipment, tools and countershaft, National Machine Company's or equal; No. 20 Tolles vises for woodworkers, length of jaw 10 in., depth 4 in., opening 12 in., as described on page 14 Wm. K. Aldrich Company's catalogue; No. 2 screw machine, with complete set of tools and countershaft, Brown & Sharpe's or equal; patternmakers' gap lathe, Putnam Machine Company's or equal.

A study of the prices realized at the recent auction sale of the equipment of the Corwin Machine Company, Peabody, Mass., accentuates the general statement that the figures were very high. A few typical sales, showing the general average of prices in their relation to the values of the machinery, are here given. A Lucas horizontal boring and milling machine, 6 ft. between faceplate and bar support, brought \$1310; a Baker Bros. No. 1 keyseating machine, \$255; a Putnam 60 x 60 in. planer, estimated to be 30 years old, \$1275; three American radials, 5-ft. arm, \$850, \$710 and \$750; a Cincinnati No. 1 plain cutter and reamer grinder, \$165; a Pond 42 x 42 in. by 12 ft. planer, about six years old, \$1770; Gisholt 42-in. turret lathe, \$1550; two Gisholt 21-in. turret lathes, \$1225 and \$1187; Pratt & Whitney toolroom lathe, \$410; Brown & Sharpe No. 1 ½-in. universal milling machine, \$575; Brown & Sharpe No. 2 universal milling machine, \$775; old style Becker-Brainerd horizontal milling machine, \$763; Becker No. 5B milling machine, \$650; Jones & Lamson 2 x 24 in. flat turret lathe, \$550; Brown & Sharpe 2B plain milling machines, \$495 and \$470. None of these machines is of a late model and most of them are of types of close to a decade ago.

The Royal Steam Heater Company, Gardner, Mass., has resumed work on the large addition to its plant, which was held up by weather conditions during the winter.

The Androscoggin Foundry, Auburn, Maine, proposes to increase its capacity this season.

Cincinnati.

CINCINNATI, OHIO, April 5, 1910.

In general machinery lines April has opened quite satisfactorily and all concerns are busy with plans for increasing shop forces or materially adding to shop capacity. The tool manufacturers have only recently experienced that sort of impetus which was largely indicated in inquiries and now some good sales are being recorded, but for the most part confined to domestic trade. European inquiry is not yet up to the anticipated volume and the business coming out is largely from the special representatives in the European capitals of the American manufacturers.

Foundries in this section are all busy and some are figuring on their supplies for the last half of the year. Those concerns making a specialty of castings for the tool trade note that the manufacturers are much more optimistic and are ordering castings in lots.

Dealers all report increased inquiry, and sales are largely of the heavier and special types. The manufacturers of milling machines, lathes, upright drills, planers and gear cutters are still operating to their capacity, and deliveries range from 30 to 90 days behind on popular sizes.

The Cincinnati Branch, National Metal Trades Association, has for several years kept a percentage record of trade conditions. The figures, based on the record of 1906-07 which was in reality better than normal, but placed at 100 per cent., show the first quarter of 1910 to be 89 per cent., as against 83 per cent. for the last quarter of 1909. These figures contemplate the output and number of operatives employed. An idea of conditions in the manufacturing field is gained from a perusal of the advertising pages of the daily papers. The *Enquirer* of Sunday, April 3, contains more requests for skilled mechanics, lathe, planer and vise hands, &c., than for three years, and these requests come from not only this locality, but Michigan, Illinois and Pennsylvania.

The John B. Morris Machine Tool Company, whose officers are also those of the John B. Morris Foundry Company, is entering the tool trade aggressively and expects to utilize every foot of the new building which is to be erected on a site adjoining the present quarters at Court, Harriet and Vogt streets. Secretary S. M. Blackburn reports business in the tool line quite satisfactory and increasing. Among the foreign orders recently booked is one for a number of geared head lathes for shipment to Hungary.

Officials of the recently organized Cincinnati Grinder Company have decided on the location of their new shops. Messrs. Hoefinghoff and Kimmel, in charge respectively of the office and shop departments, have contracted with M. L. Andrew, manufacturer of wood boring machinery, who is building on the northwest corner of Colerain and Alabama avenues in the Camp Washington tool manufacturing district, for the second floor of that building and expect to get in by June 1. There will be 6500 sq. ft. of floor space available for each concern in the new building. Mr. Andrew will occupy the first floor of his new building himself and expects to be in by June 1. He may purchase a few additional machines and tools, but will not decide until after he gets into the new quarters.

The Building Committee of the University of Cincinnati is expected this week to award contracts on the new engineering college to be erected on the property of the institution in Clifton. There are 75 separate bids. The tool manufacturing interests of Cincinnati are greatly interested in this enterprise because of the close working relations between the shops of the city and the university.

Among the new enterprises which the Cincinnati Industrial Bureau has on file for location or improvement is one calling for the building of a drop forging plant and the securing of a practical man to act as its superintendent and manager. Local interests are ready to put up \$25,000 when the proper parties have been interested. There will be, of course, some new machinery and appliances required, but the question of the manager or superintendent is the first consideration. One of the announced policies of the Industrial Bureau for this year is to strive for the location of industrial plants, of which there are a dearth, and the drop forging plant is in this category.

T. King Wilson of Chillicothe, Ohio, has petitioned the court of Scioto County to dissolve the Scioto Tool Company, which is capitalized at \$10,000 and was organized in 1907 to manufacture a railroad spike puller.

Work has begun on the new pulverizing plant for which a charter was taken out a few days ago by the West Pulverizing Machine Company, Asheville, N. C. The plant will be built on the French Broad River and it is hoped to have it in operation during the summer. Pulverizing machines

will be built. It is a close corporation, capitalized at \$25,000. A. Lincoln West is president.

Quite a list of metal working machinery and tools will be disposed of in Cincinnati April 19 at the trustee's sale of the Dohme Jewelry Company and the Herman Keck Mfg. Company. Robert De V. Carroll is trustee, 1127 Union Trust Building.

Pittsburgh.

PITTSBURGH, PA., April 5, 1910.

During the closing days of March the trade of most large manufacturers and dealers in this district was stronger than it has been for six to eight weeks, and April is starting in equally well. Some large contracts which have been hanging fire and were not expected to be closed for at least a month or two to come have been secured by representatives of Pittsburgh concerns, and other leading companies in the surrounding territory from whom any direct advices are obtainable report similar conditions. Prospects for the immediate future are very encouraging, particularly as there seems to be a marked unanimity of sentiment in relation to it.

Considerable interest in American machinery, including mechanical, electrical and pneumatic appliances, is manifested abroad, where there have recently been a number of notable sales at good prices. Orders for spare parts, repairs, &c., are also arriving in some volume, indicating that European users of apparatus originally exported from here are putting their factories, tramways, power plants, &c., in good operating condition.

Manufacturers throughout this section are beginning to regard Mexico as one of their most promising markets and to take more pains to cultivate trade there by means of direct representation than they have been accustomed to do in previous years. Salesmen for some of the more important concerns make their headquarters not only in Mexico City but also at other cities, which, while not large in population, are centers of important operations, especially in mining, hydroelectric power development or irrigation. Many of the enterprises recently undertaken in Mexico have been financed by Pittsburgh capital and some are directly connected with prominent industrial operations of this district. Most of the machinery required, inclusive of power equipment, will also be supplied from plants whose headquarters are here, and in the aggregate it will run into hundreds of thousands of dollars between now and fall, with much more in prospect. Among the newer industries of our neighbor to the south is the manufacture of Portland cement, in which the present year has already witnessed important developments.

The large demand at present existing for appliances of all kinds utilizing compressed air is shown in the business being done by the Pittsburgh Pneumatic Company, Canton, Ohio, whose riveters, chipping hammers and other products have sold to exceptional advantage ever since the revival in manufacturing started, orders coming freely from every industrial district of the country.

Among large contracts recently taken by the Westinghouse Electric & Mfg. Company is one for a generating unit to be installed in the plant of the People's Power Company, Moline, Ill.

The Postville Light & Heating Company recently organized at Emmetsburg, Pa., will install a power plant in that vicinity.

The Pittsburgh office of the Pennsylvania Crusher Company has found the market particularly strong of late for its steel hammer crushers, which have been adapted to a great variety of service.

Considerable new machinery, including power equipment, will be needed this spring in reconstructing the plant of the Harris Brick Company at Zanesville, Ohio, which is now understood to be controlled by the Moores-Coney Company, a large construction firm of Cincinnati.

Pittsburgh dealers are expecting to figure on equipment for an addition to the National Car Coupler Company's works at Attica, Kan., which is reported to have been decided upon.

A foundry of moderate capacity will be added shortly to the factory of Geo. Cotter & Co., South Bend, Ind.

Additional machinery will be required shortly by the Mount Union Silica Brick Company, Mt. Union, Pa., including crushing, grinding and mixing apparatus, steam cylinders, conveyors, &c., for an extension of its works.

The Portsmouth Machine & Casting Company, Portsmouth, Ohio, has inaugurated a number of improvements, including installation to be made of new equipment, which will largely extend the capacity of its plant.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, is finding an excellent market for its product all through the Northwestern States, particularly in Minnesota, North and South Dakota. The Landers-Morrison-Christianson Company is sales agent for that territory, with offices in Minneapolis.

Machinery to provide for an increase of capacity in its crushing plant will be installed by the White Sulphur Stone Company, Delaware, Ohio, including a No. 5 gyratory breaker.

A producer and gas engine of 300 hp., with electric generator, is being provided for the new foundry and finishing plant of Stanley G. Flagg & Co., Stowe, Pa. They will be of Westinghouse design.

The New River & Pocahontas Consolidated Coal Company, Berwind, W. Va., has decided to install a motor generator set of 200 hp. and a line of power transformers.

A boiler and engine of about 200 hp. capacity will be required for the plant of the New Idea Spreader Company at Maria Stein, Ohio, together with other equipment.

Plans for a new factory building are being prepared by the Butler Concrete Mfg. Company, Butler, Pa.

A three-story plant, 50 x 175 ft., will be erected at Ashland, Ohio, by the Faultless Rubber Company. The details of equipment, which will include a power unit, have not yet been fully outlined.

Some new apparatus for the municipal power station at Rising Sun, Ohio, will be purchased early in the present month.

J. H. Hillman & Son have removed to their new quarters, rooms 2124 to 2128 Henry W. Oliver Building, Pittsburgh.

The Keystone Driller Company, Beaver Falls, Pa., contemplates installing 150 hp. additional boiler capacity. The company manufactures boilers and will build its new equipment in its own shops.

The American Car & Foundry Company is increasing the capacity of its power plant at Huntington, W. Va., and has placed an order with the Allis-Chalmers Company for an 18 x 24 in. single tandem gas engine, direct connected to a 250-kw., 240 to 250 volt, direct current generator. The engines will operate on natural gas.

Milwaukee.

MILWAUKEE, WIS., April 5, 1910.

Manufacturers and dealers in machinery all through Wisconsin have again been experiencing a very active demand. Inquiries are plentiful and orders in considerable volume continue to come in. Some lines of foundry and machine shop equipment are over sold. As a side issue of the automobile business, the installation of shops for repair work in connection with garages located at all of the principal centers of population is becoming a feature of importance to the machine tool trade and there will be a great many small enterprises of this kind started during the spring and early summer months. Some of these garage shops are also doing light machine work of other kinds for the communities which they serve, and promise to develop along lines quite independent of their original purpose.

Most prominent in the present situation, however, is the heavy demand for electrical machinery, switchboards, controllers and auxiliary apparatus of various descriptions. With hardly an exception, the new shops, mills and factories now being erected are arranged for motor drive and in practically all of the existing establishments where extension or remodeling is under way, the electrical system is being introduced. The same may also be said of operations in yards, docks, terminals, mines, construction work, &c. This has been commented upon heretofore; but the tendency in that direction at present is far greater than it has been at any previous period. The number of individual power plants continues to increase; and, at the same time, public service corporations throughout the State are enlarging the capacities of their stations, the result being to create a correspondingly large demand for steam, gas and hydraulic units, with everything pertaining thereto.

Milwaukee and its environs, as the country's leading center for the production of machinery used in mines, ore reduction mills and smelters, have likewise felt the impetus of the development work now being carried forward in mining districts in all parts of the world. Concerns such as the Power & Mining Machinery Company, Allis-Chalmers Company, Nordberg Mfg. Company, T. L. Smith Company, Fred M. Prescott Steam Pump Company, Filer & Stowell Company, Wisconsin Engine Company, Milwaukee Locomotive Mfg. Company, Dings Electro-Magnetic Separator Company, and numerous others manufacturing various subsidiary details of equipment, are booking a large volume of business from this source. In fact, the most notable contract of the kind placed in any country, for about three years past, was recently let to one of the companies mentioned, as stated below. This demand gives evidence of steadily increasing; and the probability is that the preparations now being made by local concerns to materially increase their facilities will still be found insufficient by fall, thus necessitating further additions at that time.

There is no doubt now but that the project for an im-

proved harbor, with large docks operated both by the city and by private corporations, will be put in execution during the present year. The effect will be to create opportunity here for the sale of a great deal of machinery for handling bulk material of all kinds and, the market is well worth cultivating in advance. Other ports of Wisconsin and the upper peninsula, along the shores of both Lake Michigan and Lake Superior, are also arousing themselves to the need of improved facilities for the handling of freight to and from vessels, and in each of these cities there are excellent prospects for the sale of equipment.

The Mitchell-Lewis Wagon Company, Racine, Wis., now identified with the Mitchell Motor Car Company, is reported to contemplate the construction of new factory buildings, but no definite plans have as yet been announced.

The Scott-Taylor Company, Ashland, Wis., will extend its plant 50 ft. and install improved machinery.

Improvements calling for the purchase of machinery and approved mechanical appliances will probably be made this season to the water works at Medford, Wis. The matter is to be decided in the near future. It was temporarily blocked by adverse action of the city council.

The building to be partly occupied by the Stroh Die Molded Casting Company, for which H. Esser, Milwaukee, has prepared plans, will be started in May or June, and considerable equipment for a private power plant, heater, blower and sprinkler systems is likely to be required. In enlarging its output, the character of which has heretofore been described, the company mentioned will also need some additional machinery, although the details of the new arrangement are not understood to have been as yet worked out.

The Racine Mfg. Company is about to take bids on the first of its new factory buildings, 100 x 200 ft., four stories, which will be of mill construction. Purchase of equipment will be made later. The list of machinery required for the rebuilt works of the company cannot fail to be a large one, but it is not likely to be bought at any one time or in any considerable quantities at a time. Temporary manufacturing facilities were provided shortly after the fire, which has enabled the company to continue its business practically without interruption, and these will suffice for some time to come.

The Wisconsin Bridge & Iron Company, Milwaukee, has elected new officers, as follows: President, J. F. Jackson; secretary and general manager, H. A. Wagner, and vice-president, J. F. Jackson. These, with Andrew Allen and E. C. Coddington, constitute the Board of Directors. Fred Weinhausen and Bertold Wagner, who have been identified with the business for years and owned a controlling interest, disposed of their stock to the interests above mentioned. The works at North Milwaukee have now an output of over \$2,000,000 annually. The capital has been increased to \$500,000.

A steam generating plant of 1000 hp., with water tube boilers, engine, dynamo and motors, will be installed in a new factory building 100 x 375 ft., which the Keely-Racine Company will build at Racine, Wis. The plans, however, have not yet been fully formulated.

Bids are being taken by the Janesville Machine Company, Janesville, Wis., for a four-story building 100 x 120 ft., which will be used for assembling and storing. The principal mechanical equipment will consist of electric motors for operating freight elevator and other light apparatus.

The Cincinnati Construction Company, whose plans for building and equipping an electric traction line from Madison to Stoughton, Wis., have previously been mentioned, are about to start work. Power details will be taken up in the near future. Jos. Ellis, the company's chief engineer, has established headquarters in Madison.

Bids will be received until April 14 for a power plant, heating, lighting and ventilating system at the Walworth County buildings, Elkhorn, Wis. Grant D. Harrington, County Clerk, is in charge of letting contracts.

The Edgerton Wagon Company, Edgerton, Wis., will erect a new plant 50 x 200 ft., equipped with considerable new machinery, including power apparatus. The plans in detail have not yet, however, been fully determined upon.

The largest contract for mining and ore reduction machinery let since the panic, according to a report just received here from London, England, has been closed by the Allis-Chalmers Company, Milwaukee, through its office in that city, with the Union Minière du Haut Katanga of Brussels, Belgium. This covers the entire equipment of crushing, concentrating and smelting apparatus for a copper ore crushing plant of 900,000 tons yearly capacity, including power and electrical machinery, to be built near Lake Tanganyika in the Congo territory of Central Africa. It is stated that this order, which comprises one of the largest and completely equipped plants in the world, was obtained in competition with European firms because of the unique ability of the Milwaukee company to supply all of the equipment under a single contract, thereby avoiding any division of responsibility.

Three return tubular boilers will be purchased for the

North Point station of the city of Milwaukee. Bids are to be taken until April 12.

The Van Brunt Mfg. Company, Horicon, Wis., is planning a new three-story factory building, 100 x 170 ft., for the production of agricultural implements, including seeders. The machinery will be electrically operated, but equipment is not to be provided for until after the building contract is let, about April 15.

A line of direct current motors for machinery drive will be provided by the Geo. Seelman & Sons Company, Milwaukee, but equipment sufficient for the near future is understood to have been recently contracted for.

Plans for the enlarged plant of the Kemp Smith Mfg. Company, Milwaukee, have been practically completed, but the construction has not yet been arranged for.

The plant of the Petrel Motor Car Company, recently acquired by members of the Filer & Stowell Company, Milwaukee, will be operated in connection with the gasoline engine works of the Beaver Mfg. Company, in which they have been interested for some time past, thereby enabling the production and assembling of the complete machines to be concentrated under one management.

The Willard-Harlow Mfg. Company has been organized at Janesville, Wis., to establish a plant for the production of automobile specialties, including radiators. Steam heating appliances will also be manufactured. No plans in relation to factory or equipment have been announced, except that electric power will be used.

An automatic high speed engine of 70-hp., alternating current generator of 40-kw., direct coupled, exciter dynamo, switchboard and auxiliary apparatus will be purchased this month for the municipal plant at Kenosha, Wis.

Six steel gates, 5 x 6 ft., will be required for the new dam of the La Crosse Water Power Company, La Crosse, Wis., which is to be 350 ft. long and 33 ft. high. An additional hydroelectric unit, and perhaps several of them, will be purchased later, but it may be some time before they are necessitated.

The contract for equipping the new coaling plant of the Soo Railroad at Fond du Lac, Wis., has been awarded to Fairbanks-Morse Company, Chicago, on the strength of the showing made by a number of similar plants recently provided for railroad lines in the Southwest and elsewhere.

The layout of the power plant to be built in connection with the new Racine Iron & Wire Works, Racine, Wis., has not yet been decided upon, but bids covering the machinery will have to be taken before long. Plans for a three-story factory structure 50 x 125 ft. are in the hands of Guilbert & Funston, Racine, Wis.

The Racine Gas Engine Company, whose shops are at Racine Junction, Wis., has developed a new motor-driven hacksaw which is meeting with a large sale. Facilities for its manufacture will need to be extended before the end of the season.

Fred L. Kronenberg, Madison, Wis., is preparing plans for a large parochial school building in which boilers, motors, ventilating fans and considerable other mechanical equipment will be required.

Hugo Koeffler, Milwaukee, will erect a three-story addition to his factory, 30 x 150 ft., which at present is leased by the Everwear Hosiery Company. The latter will install some new machinery and the mechanical equipment of the building itself needs to be increased.

From Negaunee it is reported that the Cleveland-Cliffs Iron Company is pushing its development work and that a large quantity of machinery and other apparatus will be needed between the opening and closing of navigation. Present work includes putting down two new shafts at the North Lake mine, extension of the Lucy mine and the opening of a new shaft between the Maas and Negaunee mines. Two new steam turbine power stations have been put in operation and preparations are in progress for the utilization of hydroelectric power on a large scale.

Electric motors, blowers and a sprinkler system, heating plant and possibly a generating set will be required for a new four-story factory building, 60 x 60 ft., for which H. Esser is preparing plans. It will be located on the south side of Milwaukee.

A drop forge plant will be installed in the works of the Hartford Plow Company, Hartford, Wis., which are to be remodeled for the manufacture of automobile parts by the Kissell Motor Car Company. A new aluminum and brass foundry will also be installed by the latter.

The Rock River Machine Company, Janesville, Wis., is adding a new machine shop to its plant. The building will be of steel and cement construction, 88 x 120 ft. It will be divided into three bays, the middle bay being 30 ft. wide and the two side bays 29 ft. wide each. The company is in the market for a 15-ton electric traveling crane, a 50-in. vertical boring mill and several small tools.

The Racine Iron & Metal Company, Racine, Wis., has filed articles of incorporation, with capital stock of \$25,000, the incorporators being M. L. Fox, Kate Fox and Nathan I. Silver. The new firm will deal in iron, brass and copper, both new and old.

Detroit.

DETROIT, MICH., April 5, 1910.

The demand made upon the productive capacity of foundries of every description constitutes the most prominent feature of the market at present, and this is a good criterion of the condition of the machinery building trade in general. Many plants are so delayed in their operations by inability to secure castings promptly that they cannot work to as full capacity as their shop facilities would permit. The result has been to encourage the installation of foundry equipment by not a few manufacturers who have heretofore depended upon custom plants and to compel jobbing foundries to do everything possible to enlarge their output. Apparatus which will save time or labor is badly needed, and those who produce such appliances have no difficulty in keeping their books filled with orders. This condition naturally militates somewhat against builders of machine tools, but the market in general is sufficiently broad to take practically all offerings that can be made on the basis of reasonably good delivery. Used tools do not sell to quite as good advantage as they did a month or six weeks ago, but dealers seem to be willing to accumulate stocks and do not come down any on prices.

A noteworthy circumstance is the ease with which motor car manufacturers obtain equipment for the new shops and works additions which they are putting up through this section. Even during the worst of the recent congestion they have had no complaint to make of slow deliveries, and there seems to be little or no difficulty in securing just what they want. In part, this condition may undoubtedly be ascribed to the unusually careful planning ahead which the leading automobile concerns have done, as the writer is in a position to personally know; but during the past few months there have been a good many new companies hastily organized, and the pathway of these has also been made smooth by practically all supply men to whom they have applied. It is true that the prices paid have been good and there has been no haggling over terms; but there is also a magic in the word automobile that carries everything before it. From present indications this trade will be cultivated for all it is worth as long as it continues to expand.

The Brush Runabout Company, Detroit, is adding to its electrical equipment, including the purchase of motors for operating machinery.

New boilers are to be installed in the municipal power plant at Galion, Ohio, the requirements being about 300 hp.

A power plant of 350 to 400 hp. will be needed for the new automobile shops at Lima, Ohio. F. F. Van Tuyl, consulting engineer, of Detroit, is understood to be in charge of the plans.

A three-story factory, 50 x 110 ft., will be built at once by the Eady Shoe Company at Otsego, Mich. Considerable machinery and other equipment, including power apparatus, is needed.

The new shops buildings which have been talked of as probabilities of the Fort Wayne Electric Company's works at Fort Wayne, Ind., will be started in the near future. No definite announcement as to plans or equipment has as yet, however, been made.

Contracts are now being let for a two-story plant, 100 x 230 ft., which the Grand Rapids Hardware Company is to erect at Grand Rapids, Mich. Machinery requirements have not yet been definitely formulated.

The Minerva Hardware Mfg. Company, Minerva, Ohio, instead of building a new plant, has acquired one fully furnished with foundry, die making and stamping facilities, and no additional machinery will be needed for the present. When its trade becomes established, however, some further apparatus will doubtless be required.

An electric power and lighting plant is planned for Waveland, Ind., but construction has not yet been authorized.

Contracts for the new foundry and power house buildings of the Ford Motor Car Company, Detroit, have been placed and construction work will be pushed.

A water tube boiler of 250 to 300 hp. will be required this spring by the Champion Iron Company, Kenton, Ohio.

Plans have been completed for a stock house 25 x 175 ft., beater room 45 x 100 ft., engine and finishing room 40 x 180 ft., paraffin room 30 x 45 ft., and other buildings for the Babcock Tissue Paper Company, Otsego, Mich., whose power requirements were recently mentioned. Machinery usual to such a plant as that outlined will be purchased this month.

Considerable power transmission machinery is to be needed by Loughry Bros., Monticello, Ind., for a three-story mill addition to be built at that place.

Most of the machinery needed for the Washington, Ind., shops of the Baltimore & Ohio Southwestern Railway will be bought this month. Some purchases, however, will be deferred until later.

The Hayes-Ionia Company, Ionia, Mich., has had plans drawn for a new three-story plant 60 x 200 ft., for which considerable equipment is required. The full details of operation, however, are still to be worked out.

Two horizontal return tubular boilers of 200 to 250 hp., Corliss or automatic four-valve engine, electric generator, switchboard, motors, shafting, belting, pulleys, clutches, &c., will be purchased shortly by the P. H. Reddinger Company, Evansville, Ind., for a two-story factory, in which wood-working machinery and a sprinkler system are also to be installed. The main building will be 50 x 150 ft., with a power house separately constructed.

The plant of the McLane Fire Brick Company, Irondale, Ohio, is being enlarged and more machinery provided.

Plans for a new factory are under consideration by the Castle Lamp Company, Toledo, Ohio, which caters especially to the automobile trade. The layout of machinery and equipment details have not yet, however, been decided upon.

From Sandusky, Ohio, it is reported that the large cement works of the Lake Shore Portland Cement Company, construction of which was started some time ago and then discontinued, will be pushed to completion this year, involving the purchase of a large quantity of power and operating machinery. Some definite announcement may be looked for shortly.

Some increase will be made shortly in the facilities of the Central Boiler & Supply Company, Grand Rapids, Mich., better known as the Central Boiler Works, including the probable erection of a new building.

Work on the proposed addition to the Overland Automobile Company's plant at Toledo, Ohio, comprising one new shop unit, will begin at once.

Among the new industrial plants to be completed in Toledo, Ohio, this spring will be one 100 x 320 ft., three stories, for the Kinsey Mfg. Company.

It is altogether probable that the Muzzy Lyons Company, Detroit, Mich., which manufactures bearings for automobiles, will be compelled to enlarge its plant or build new shops, as it is now working full shifts both day and night and offerings of business continue to increase.

The Cincinnati, Hamilton & Dayton Railroad is rushing work on what are stated to be the largest ore handling docks at the lower end of the Great Lakes route, approximately \$1,000,000 having been set aside for the purpose, including also new coal docks. The machinery to be installed will be the best that can be provided and in its electrical part will embody some new features designed to insure steady operation and facilitate control. Some contracts have been let and others will be closed as necessity requires. There will be storage bins for 900,000 tons of ore.

The purchase of a new pumping unit is under consideration by the authorities at Albion, Mich.

A new three-story factory building, equipped throughout with motor drive, exhaust blowers, sprinkler system, &c., will be erected at Evansville, Ind., by the Crescent Furniture Company. Purchases of the necessary apparatus will be made about May 1.

The plant which the Northway Motor & Mfg. Company is planning to build in Detroit this spring will be 220 x 300 ft. and equipped with a full line of machinery for the production of automobiles, all electrically driven. Purchase of equipment will be taken up as it is needed.

The Cudney Boiler Works, Cadillac, Mich., is building a large steel stack for D. H. Day's plant at Glen Haven, Mich.

The S. B. Martin Company, Fiborn, Mich., is arranging for the installation of a limestone crushing plant of 8000 to 10,000 tons capacity, with which to supply flux for blast furnaces. The principal equipment, which has been ordered from the Power & Mining Machinery Company, Milwaukee, includes a gyratory breaker of the largest size built. It will take rock 3½ ft. in diameter and reduce it to small fragments.

A large addition is about to be made to the electric generating station of the Toledo Railways & Light Company at Toledo, Ohio, to provide for the installation of one or more new batteries of boilers, with a complete line of auxiliary apparatus and the probable purchase of steam turbine units.

The Bagley Land Company, Ltd., Detroit, is erecting for the John J. Bagley Company, tobacco manufacturer of that city, a six-story reinforced concrete and steel factory building at a cost of \$120,000, a one-story boiler house and a two-story warehouse.

The Metzger Motor Car Company, Detroit, Mich., which last December absorbed the Hewitt Motor Company, New York, announces the final taking over of that company and the reincorporation of the Metzger Motor Car Company at \$1,000,000. The company has plans prepared for a new factory building at Detroit, of reinforced concrete, 100 x 300 ft., three stories, which will be erected at cost of \$300,000. The new building will be devoted to the manufacture of commercial vehicles and every part contained in their construction.

The Northern Engineering Works, crane builders, Detroit, has been placing orders for new tools and machinery, consisting largely of lathes, gear cutters, milling machines, &c., for several months past, and the machinery is now being installed. It reports a good volume of business on its books, the demand for its standard electric traveling cranes being unusually good.

The Brush Runabout Company, Detroit, will add to its facilities for the manufacture of automobiles by the erection and equipment of three two-story buildings, brick and steel construction, 128 x 152 ft., 132 x 152 ft. and 33 x 152 ft., at Oakland street and Massachusetts avenue.

Robertson Bros., Ltd., of Birmingham, England, will establish a Canadian branch of its cork manufacturing industry at Port Colborne, Ont., and plans for the plant, which will be erected on the east bank of the Welland Canal, are being completed.

The Linderman Machine Company, Muskegon, Mich., has let contract for a building 66 x 160 ft., one story, of brick and concrete construction. The company will manufacture the Linderman dovetail glue jointing machine. Contracts for all the machinery have been let, with the exception of an air compressor and electric generator.

The Central West.

DES MOINES, IOWA, April 4, 1910.

As a future market for machinery, including shop and foundry equipment of all kinds, the industrial importance of the States between the Mississippi River and the mountains will be almost doubled during the present year, if building continues at the present rate. Cities which have heretofore been manufacturing centers are adding many new industries, and numerous other foundries, shops, mills and factories have been started at interior points where practically nothing of the kind has existed before. In most cases, probably, all but a controlling interest in the stock is held by a good many small shareholders in the same community, often employees of the concern of their relatives, and this condition makes for a stability which renders the trade of any such plant well worth cultivating with a view to its future growth.

A. L. Peterson, Cresco, Iowa, has had plans prepared for a new factory building, and the details of equipment will be provided for shortly.

The Fort Dodge Iron & Metal Works, Fort Dodge, Iowa, has increased its production facilities by the lease of another plant.

A new boiler and two heaters have been installed by the city of Omaha, Neb., at its asphalt plant.

William Schweitzer, Hannibal, Mo., will provide some additional power equipment for his plant this summer.

A two-story building will be added to the manufacturing plant of the Laros Buggy Company, Grinnell, Iowa.

During the year some machinery will need to be provided for the works of the Davenport Machine & Foundry Company beyond what has been already installed, if the demand for its various products is fully met. No definite plans have, however, been made.

A new factory is to be built this spring at Morrison, Iowa, by the Morrison Specialty Company.

A steam turbine power plant, with one or two 2000-kw. generating units, will be installed in a new structure to be built this year by the Clinton Gas, Light & Coke Company, Clinton, Iowa. Boilers, heaters, pumps, condensers and a complete line of auxiliary electrical apparatus will be needed.

An electric power and lighting plant to be operated by the town has been decided upon at Crab Orchard, Neb. Machinery will be purchased in the near future.

The Norwalk Lumber Company, Norwalk, Iowa, is contemplating the installation of machinery for a planing mill and cement products factory, including production of building blocks.

The Mayo River Power & Land Company expects to commence work in September on a 10,000-hp. hydroelectric plant on the Mayo River near Hermosillo, Sonora, Mexico. The headquarters of the company are at Denver, Colo., and an engineering firm of that city is in charge of the plans. This is stated on reliable authority to be one of the most valuable concessions for the development of power that citizens of the United States have obtained in Mexico for some time.

Machinery for one of the largest municipal power plants in the West will be provided this year by the authorities at Provo, Utah, if the proposed bond issue is approved.

The Western Pneumatic Machinery Company, Salt Lake City, Utah, has been organized to establish a plant for the manufacture of drills and other apparatus using compressed air.

A complete system of water works, equipped with every modern mechanical appliance, will be constructed this summer at Ephraim, Utah, where funds have been provided for the purpose.

The Chief Consolidated Mining Company, Eureka, Utah, is arranging for the purchase of a battery of steam boilers and power machinery, including a large hoisting engine.

Additional equipment will probably be required later in the year.

The Tucson Iron Works, Tucson, Ariz., has filed articles of incorporation, with capital stock of \$100,000. The company will conduct and carry on a general foundry business and the manufacture of machinery, supplies, utensils, tools, appliances, boilers, engines and products of iron, steel, copper and other materials. The officers of the company are W. B. Coberly, president; M. J. King, vice-president; R. K. Shelton, secretary and treasurer.

The Gunnison Valley Power Company, Gunnison, Utah, incorporated at \$50,000, will locate a plant on Six Mile Creek, where a sufficient amount of water fall can be obtained to develop 400 hp. Preliminary plans for the plant have been completed and work will be begun at once, with the expectation of having the plant ready for operation by August 1. Equipment to be installed in the plant will be of standard make, and to insure minimum loss in transmission large section copper wire and high voltage will be used.

The South.

BIRMINGHAM, ALA., April 2, 1910.

The market for machinery all through this part of the country has been strengthened considerably by renewed buying on the part of some of the iron and steel companies, mine operators and industrial roads. A great deal more will be done before hot weather sets in, and further extensions are planned for the autumn season, when some new districts are to be opened up. Foundries and machine shops here, including builders of general power and industrial machinery, have in practically every case been rushed with orders recently. Allusion has already been made to the Hardie-Tynes Mfg. Company, Decatur Car Wheel & Mfg. Company and a number of concerns located nearby, whose activity has been especially pronounced. In addition to these there might be particularly mentioned the Birmingham Machine & Foundry Company, Payne & Joubert Machine & Foundry Company, the Birmingham Car Wheel & Foundry Company and the American Cast Iron Pipe Company. Agents and salesmen of Northern manufacturers who have offices in Birmingham have also been doing an excellent business lately, although for a time there was a lull in buying which threatened to last longer than it did.

Construction of a new central power plant at Birmingham, Ala., is reported to be under consideration by the Tennessee Coal, Iron & Railroad Company.

The Chattanooga branch of the United States Cast Iron Pipe & Foundry Company has taken the largest order for water mains let in the South for some time past. It comprises about 14,000 tons of piping, in sizes up to 60-in., for the water distribution system at Atlanta, Ga.

A municipal power and lighting station is being planned for Farmville, N. C. Machinery requirements have not yet been determined upon.

The Clinchfield Coal Corporation, Dante, Va., will need considerable equipment this summer for use in opening up five additional mines. A new central power station may also be built.

A producer plant will be among the requirements of the Edisto Kaolin Company, Samaria, S. C., for works to be established at Steedman, S. C. This is a new incorporation.

The Southern Well Works, which removed to Chattanooga from Beaumont, Texas, and has been carrying on a large business in all parts of the South, may enter upon the manufacture of automobile motors.

The Decatur Car Wheel & Mfg. Company, which was originally established at Decatur, Ala., but has for some years past been among the leading industries of Birmingham, will be compelled by the press of this year's orders to provide for a greatly enlarged output in future.

A line of alternating current motors for direct machinery drive will be installed in the plant of the Great Southern Lumber Company, Bogalusa, La.

The new factory of the Old Dominion Table Company, now under erection at Norfolk, Va., will be equipped for electric drive.

Improvements are to be made this season in the water works system at Lynchburg, Va., involving the purchase later on of considerable equipment.

Machinery for contemplated alterations in the layout of its works and a steel storage reservoir will be required by the Kenesaw Marble Company, Marietta, Ga., from whom the details can be obtained by direct inquiry.

The electric plant operated at Lafayette, Ala., by the municipality will be enlarged and new machinery installed. Pumping units for a water system are also to be purchased.

The Foster-Creighton Gould Company, Nashville, Tenn., one of the largest users of bridge material in this section, is gradually extending the scope of its operations. Among contracts recently taken was one for a steel and concrete structure across the Chattahoochee River at Columbus, Ga., for the Central of Georgia Railroad.

It is reported from Cleveland, Tenn., that D. W. Meyers, residing elsewhere at present, has concluded arrangements for the erection of a machine shop there.

Boilers, heater, Corliss engine, pumps, grinders, mixers, steam cylinders, conveyors will be required for a new sand-lime brick plant to be erected by H. H. Tift of Tifton, Ga. The equipment will include a steel cylinder 75 ft. long and 6 ft. in diameter, into which bricks from the press will be run for hardening.

It is reported from Florence, S. C., that bids on a pump and air compressor will be taken up to and including April 18. J. N. Johnston is the engineer in charge of water works improvements.

Construction of a municipal power and lighting station has been authorized at Farmville, N. C., and a generating set will be purchased in the near future, together with auxiliary apparatus.

The Federal Government will install an electric lighting system at Fort Barrancas, Fla. Tenders have been invited.

A hydroelectric plant for municipal service is to be constructed by the city of Sylacagua, Ala., steps having been recently taken to secure a suitable power site in the vicinity.

Two 150-hp. boilers, pumping engines to deliver 8,000,000 gal. daily and a mechanical filtration plant will be required this spring by the city of Clarksburg, W. Va. No purchases have as yet been made.

The Louisville Lighting Company, Louisville, Ky., has just closed a contract for a 5000-kw. steam turbine and alternating current dynamo. The unit will be of the General Electric Company's improved horizontal type.

Some additions will be made shortly to the equipment of the Chickamauga Quarry & Construction Company, Chattanooga, Tenn., including apparatus for the crushing plant.

The Austin Bridge Company, Atlanta, Ga., has taken contract for a steel bridge across the Flint River at Decatur, Ala.

The Columbia Iron Works, Chattanooga, Tenn., is doing a particularly good business in the Southwestern States, owing to the large demand there from municipalities and water companies for its mains, valves, hydrants, &c.

Balke & Co. are planning to put up a new foundry and fabricating plant adjacent to their present works at Louisville, Ky.

The nine mill buildings which will constitute the works of the American Cement Company, Berkley, Va., will be completed and machinery installed about August 1. Some of the apparatus required is understood to have been already contracted for, but various purchases will be made at intervals during the spring and early summer months.

Plans for a three-story plant, 90 x 230 ft., have been drawn for the Parker Buggy Corporation, Franklin, Va., and the details of equipment are now to be taken up. It is reported, although without confirmation, that assembling of automobiles for the Southern trade will be taken on as a side line.

The much discussed project for a large hydroelectric power plant to be built near Warwick, Ga., has taken form in the incorporation for \$1,000,000 of the Flint River Power Company. It is understood to have been actively promoted by D. G. Zeigler, Jacksonville, Fla.

Bids will be opened April 12 for the material and labor needed in the construction of a water works and sewer system at Kissimmee, Fla. J. R. Gilbert is city clerk; Xavier A. Kramer of Magnolia, Miss., is the engineer in charge.

Sealed bids will be received by the Mayor and Board of Aldermen of Breaux Bridge, La., until May 3, for a complete water works system, including the necessary cast iron pipes and hydrants, valves, &c., and the power plant equipment, which will consist of two 100-hp. boilers and two duplex pumps. Specifications may be obtained from John Comeau, city clerk.

On April 18 Florence, S. C., will open bids for a lot of material to be used in the extension of its water works system. Among the requirements is an air compressor and a large list of hydrants, valves, &c.

The plant of the Colonial Stove Works, Queenstown, Ala., is practically finished and the company is in the market for a complete steel department equipment for manufacturing coal and gas ranges. It would also like to get in communication with firms manufacturing gas stove valves, safety oven lighters and other parts used in the manufacture of gas stoves. The post office address of the company is Alton, Ala.

The Harry Brothers Company, New Orleans, La., has tentative plans under way for establishing a branch factory in Canada to manufacture its patent knockdown grain and water tanks.

The Beck Machine Company, Winston-Salem, N. C., is erecting a shop building which will be equipped for general machine repair work. The company is in the market for a small engine lathe.

A large cement plant is being erected by the Norfolk Portland Cement Company at Norfolk, Va. John W. Eckert, Allentown, Pa., is general manager of the company.

The Southern Equipment Company, W. J. Alford, manager, North Birmingham, Ala., will be in the market shortly for the following: Thirty tons No. 0 trolley wire and 22

tons No. 00 water proof feed wire, 25 miles new 56-lb. rails with angle bars and spikes, approximately 30 ground throw switch sets, 56-lb. rails, 20,000 flat tie plates. Within the next 30 days the company will also want bids for complete electrical and power plant equipment for four power stations. Considerable structural steel material for bridges and reinforcing bars for concrete work will also be required.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., has awarded contract to Howard Eggleston, James Building, for a two-story addition to its factory, 60 x 70 ft.

The Atlanta Northern Railroad Company, Atlanta, Ga., is building two substations along the line of its road. The equipment for each of these stations, which consists of a 500-kw. rotary set, has been purchased from the Westinghouse Electric & Mfg. Company.

The Northwest.

ST. PAUL, MINN., April 4, 1910.

Mines, concentrating plants and smelters are quite heavy buyers at present, and the same may be said of saw mills, planing mills, flouring mills, &c., as well as grain elevators, although the proportion of business received from the two last named is, of course, relatively much smaller.

Elections held this month in many cities, towns and villages of the Northwestern States are also certain to authorize numerous bond issues for pumping stations, filtration plants, electric power and lighting systems, &c., and May will undoubtedly be one of the most favorable months in the year for the sale of machinery to municipalities. Manufacturers should take pains to post themselves now on the requirements of the various communities, as in not a few cases very little time will elapse between the dates when bids are advertised for and contracts are closed. Public service requirements are particularly urgent this season, owing to the recent rapid growth of some of the smaller cities in which manufacturing has been started, and pressure of public sentiment is forcing municipal officials to take uncommonly prompt action in meeting these demands.

For shop and factory equipment trade continues very satisfactory to local dealers. The present month starts in well and there is every indication that its record as a whole will be good.

Contract for an ore dock to be built at Two Harbors, Minn., by the Duluth & Iron Range Railway, has been awarded to the Barnett & Record Company, Duluth. Purchase of the handling equipment is understood locally to have been deferred until later.

The Clyde Iron Works, Duluth, Minn., is reported to be working on a large order of machinery intended for installation on the Isthmus of Panama.

The Imperial Iron Works, Duluth, Minn., which makes a specialty of mining machinery, including power plant equipment, is planning the erection of a large foundry; but no definite announcement has as yet been made concerning the apparatus which will be required.

A three-story factory, 70 x 150 ft., fitted with power and woodworking machinery, will be built in St. Paul by the Twin City Mission Furniture Company. Purchases are not to be made until later.

The project for a municipal power plant at Duluth, Minn., is rapidly coming to a head, and purchase of machinery may be considered before autumn.

A foundry, 30 x 50 ft., machine and assembling shops 80 x 200 ft., and other buildings, will be erected at Minneapolis by the Imperial Mfg. Company, which succeeds to the gasoline engine business of the Valentine Bros. Mfg. Company and the implement trade of another local concern. Equipment heretofore in service can be largely utilized, but some new machinery is needed.

From Anoka, Minn., it is reported that a vote will be taken on April 19 on issuing bonds for \$45,000 for the construction of a power dam on the Rum River and for \$15,000 for the erection and equipment of substations, pumps, transforming stations, &c., in connection with the light and water plant.

The Keller Mfg. Company's new plant in Minneapolis will be 180 x 250 ft. in its main part, of brick and steel construction, and equipped with modern clay products machinery.

Strayer & Nesbit, Minneapolis, as fiscal agents for an Eastern company, have charge of plans for a large stove factory, to be electrically operated, which will be built during the summer.

The American Clay Products Mfg. Company is completing a large plant at Stillwater, Minn., for which the most modern machinery has been provided. From present indications it will be necessary to add another manufacturing unit before the end of the season.

A new use for steel plates, as reinforcement for a concrete shafting lining, is about to be tried by the North American Mining Company, Duluth, at its Tower, Minn., property.

A good many orders have been taken this year all through the Northwest by the Watrous Engine Works Company, St. Paul, for gasoline engine-driven pumping units, together with piping, valves, hydrants and other auxiliaries

that go to make up the complete mechanical equipment of water supply and protection systems. The demand at present is such as to call for an enlargement of the company's plant.

Some power apparatus and woodworking machinery will be needed for a new plant which the Watertown Wood Works, recently organized, will erect at Watertown, S. D.

Machinery for a new power plant is to be bought within the next few weeks by the Aberdeen Street Railway Company, Aberdeen, S. D.

Plans are being drawn for a factory 60 x 150 ft., to be erected in St. Paul by the Schurmeier Motor Car Company. Machinery, including equipment for electric drive, will be contracted for in about six weeks or possibly sooner. The design of the plant is by Buechner & Orth, St. Paul.

The Crookston Water Works, Power & Light Company, Crookston, Minn., will begin work in the near future on the erection of a large plant, the location and size of which has not been decided as yet.

The Dempster Mill Mfg. Company, Beatrice, Neb., manufacturer of farm implements and machinery, has increased its capital stock from \$750,000 to \$1,000,000. \$100,000 of the new stock will be used for increasing the working capital of the company.

The Southwest.

KANSAS CITY, Mo., April 4, 1910.

During the past week the volume of orders received from various points in the Southwest appears to have been very even, and in many cases sales have followed hard upon inquiries, indicating that buyers' minds are pretty well made up as to what they want. In fact rush orders are increasing, and considerable business is being closed upon a noncompetitive basis where machinery houses are ready to guarantee prompt delivery. This is particularly true in the case of manufacturers' agents or direct representatives who have been a long time in the trade and whom customers feel they can trust to do the right thing, such confidence constituting an especially valuable asset in this part of the United States, where the man selling machinery is given fully as much consideration as the apparatus itself in determining the merits of the latter. For the next month or six weeks, at least, trade is certain to be good, and the probability is that the

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present period of activity in buying will last until after the beginning of summer.

The Lufkin Foundry & Machine Works, Lufkin, Texas, will furnish the complete equipment for the Peavy-Byrnes Company's new mill at Kenner, La.

An alternating current generator of about 125 to 150 kw. capacity, engine or turbine driven, will be purchased this spring for the new municipal power plant at Syracuse, Kan., bonds for the construction of which have just been issued. Considerable auxiliary apparatus will also be needed.

G. M. Griswold, Kingman, Kan., will be in the market about June 1 for some power and operating machinery to be used in the manufacture of building material.

A woodworking plant 100 x 165 ft. will be built in Kansas City, Mo., by the American Sash & Door Company.

Machinery for a large band mill, resawing and veneer plant will be required in the equipment of buildings which Lee, Wilson & Co., Wilson, Ark., will erect in the place of those recently burned.

Contract for a pumping plant and the construction of a modern sewage system will be let, after April 27, at Newport, Ark.

Extensions which the John Deere Company, Moline, Ill., have for some time contemplated making in their branch works at Fort Smith, Ark., known as the Fort Smith Wagon Company, will be started in the near future, involving the purchase of considerable new equipment. The machinery is to be electrically operated.

An electric power set is to be installed at Eureka Springs, Ark., by the Eureka Springs Electric Company.

The Little Rock Railway & Electric Company, Little Rock, Ark., will be in the market shortly for woodworking tools and other machinery to be used in a car repair shop.

A steam power plant and electric generators, motors, &c., as well as shop equipment, will be required for the repair plant of the Missouri Pacific Railroad Company at Argenta, Ark., if the shops are rebuilt, as now seems probable. In that event the capacity will be at least double what it was prior to the fire.

An alternating current generator of 200 kw., with exciter dynamo, switchboard, motors, &c., will be installed early in the coming summer by the Three States Lumber Company, Burdette, Ark.

The city power and lighting station at Elk City, Okla., will be enlarged and some new machinery purchased.

A three-cylinder steam pump will probably be required in the near future at the municipal plant in Okmulgee, Okla.

The San Antonio Portland Cement Company, Centerville, Texas, will add to its equipment for motor drive.

A new foundry building 200 ft. long will be erected at St. Louis, Mo., by the Hewitt Mfg. Company. The A. E. Baxter Engineering & Appraisal Company, Buffalo, N. Y., are in charge of the plans. The equipment will be largely special and has been arranged for.

H. M. Bradley, Kansas City, is preparing to establish a plant for the manufacture of gasoline motors at Lake Charles, La.

The Union Bridge & Construction Company, Kansas City, recently increased its capital, which is now \$100,000, and will extend the scope of its operations.

Funds for the construction of a pumping plant and water works system at Scandia, Kan., heretofore mentioned, have been provided, and bids on equipment will be considered shortly.

The Illinois Steel Bridge Company, through its Kansas City office, has done a very satisfactory business this season in the Southwest, and indications for the future are favorable.

The H. W. Graber Machinery Company, Austin, Texas, is preparing to largely extend its trade, an increase in capital having recently been provided for.

Upon completion of important improvements and extensions now about to be undertaken, the Citizens' Light & Traction Company, Pine Bluff, Ark., will require enlarged power equipment. The details, however, have not yet been decided upon.

The Fort Smith Light & Traction Company, Fort Smith, Ark., has placed a rush order with the Kansas City office of Allis-Chalmers Company, Milwaukee, for a new engine and generator, the latter being an 800 kw., 600 volt, 100 rev. per min., direct current machine of the railway type.

The Kansas City Packing Box Company is adding to its facilities for electric drive at the plant in Kansas City, Kan.

Funds for the construction of water works at Greenville, Texas, have been provided, and machinery for the pumping plant will be bought this spring or early in the summer.

B. B. Thornton, Bolton, Texas, will be in the market for an engine, dynamo and other apparatus.

An additional pumping unit will probably be provided at some time during the year for the water works at Guthrie, Okla.

Excavating, mixing, power and pressure machinery are reported to be among the requirements of the Sedalia Clay Mfg. Company, Sedalia, Mo., which will enter very extensively this season upon the production of a line of building and contractors' material.

The Ford Motor Car Company of Detroit, Mich., is erecting a building in Kansas City, 80 x 400 ft., which will contain some tools for repair work.

Two Gates breakers and a Williams pulverizer, with power apparatus, have been added to the mechanical equipment of the Moline Lime, Stone & Cement Company, Moline, Kan.

A new pumping unit is to be provided this spring for the water works at Houma, La.

The Western Iron & Foundry Company, Wichita, Kan., has been incorporated and will provide for a large season's output.

Some additional machinery will be needed this year at the municipal plant in Stafford, Kan. An engineering firm of Kansas City has been requested to submit plans for the contemplated improvements.

Machinery for a large stave mill will be needed by the Newport Stave Company, Eldorado, Ark., for the plant which it is about to erect at Robeline, La.

The Arkansas City Portland Cement Company, Arkansas City, Kan., will provide new elevating machinery for its crusher plant.

J. E. Bausbeck, Center, Texas, will probably establish a handle factory at that place.

A rotary converter of 2000 kw. capacity, for changing alternating to direct current at 550 volts pressure, will be purchased this spring by the Metropolitan Street Railway Company, Kansas City, Mo.

Watson & Even, Little Rock, Ark., have secured a site in that city, where they propose erecting a refrigerating plant at a cost of \$150,000. The company has also secured a franchise from the city for the construction of a pipe line so that refrigerating plants can be installed in business houses of the city.

The Fort Smith Wagon Company, Fort Smith, Ark., is erecting an addition to its plant 100 x 165 ft., two stories, of heavy mill construction, which will be used for warehouse and shipping purposes.

The Mitchell & Mitchell Mfg. Company, Fort Smith, Ark., is contemplating erecting a new factory building which will double the size of its present plant.

There is a brisk demand for irrigating machinery in Texas, particularly in the southern part, where many agricultural development enterprises are on foot. It is stated that there is a falling off in the sale of cotton ginning machinery this spring as compared with previous seasons. The lack of rainfall has been discouraging to farmers. In other machinery lines the demand is good, with the prospects of a larger spring and summer trade than usual.

J. H. Hexter and associates, all of Victoria, Texas, have applied to the Council of that town for a franchise for a street railway, which will be operated either by electricity or gasoline motors.

The city of Dallas has let the contract for the construction of a dam across White Rock Creek, 6 miles from that city, for the purpose of forming a storage reservoir for the water supply of Dallas. The cost of the dam will be about \$250,000. Considerable machinery will be installed. The Fred A. Jones Company, Houston, has the contract for building the dam.

Maclin Robertson, Salado, Texas, and associates are promoting the construction of an interurban electric railway to connect that place with Temple, 14 miles.

The Texas City Company will double the capacity of its electric power plant at Texas City. The present capacity of the plant is 500 kw.

John Young of Alpine, Texas, and associates will install machinery at their extensive marble quarries near that place.

The International & Great Northern Railroad will build boiler shops at San Antonio, Texas. It is stated that about \$50,000 will be invested.

Mexican Notes.

The Sierra Mining Company, Ocampo, Chihuahua, Mexico, Robt. Linton, superintendent, will undertake some extensive development work in which additional machinery will be required later on.

A motor-driven pumping unit and electric hoist are being installed in the Duluth mine of the Cananea Consolidated Copper Company, Cananea, Sonora, Mexico.

Water works, including a modern high duty pumping plant, will probably be constructed this year at Contepec, Mexico.

The Veta Colorado Mining & Smelter Company, Villa Escolebdo, Chihuahua, Mexico, will be in the market during the latter part of the year for considerable new machinery, if present plans are carried out.

The Cia. Manufacturera de Cemento Portland, with offices in Mexico City, Mexico, will add a large rotary kiln, pulverizers, motors and other machinery to the present equipment of its works. A part of the apparatus has already been contracted for.

The Magistral-Ameca Copper Company, Ameca, Jalisco, Mexico, whose plans for new operating machinery were mentioned a few weeks ago, will also install an electric power and lighting plant to serve the mines and ore reduction mill.

The Tominil Mining Company, Tominil, Durango,

Mexico, is planning to install two new tube mills and driving machinery.

The Tigre Mining Company, Yzabal, Sonora, Mexico, in which Missouri capitalists are interested, will be in the market this year for some machinery, although plans involving further equipment have not yet been fully made.

The Pacific Coast.

SEATTLE, WASH., March 30, 1910.

Unfavorable weather, threatening labor conditions at various points and continued congestion of traffic along some lines have conspired to set back business; nevertheless, the machinery trade of the entire Pacific slope continues to show improvement, inasmuch as the demand from the general industrial field, as distinguished from special lines such as saw-milling and mining, is widening from one week to another. Foundries, machine shops and metal working establishments of all kinds are particularly active. Nearly all such plants have begun or completed considerable additions to their facilities. Recent combinations of interests in related lines also serve to strengthen a number of the leading concerns and put them in a position to compete to better advantage with large Eastern manufacturers. Repair work of every description has been pushed and industrial plants everywhere on the coast are settling down to long, steady runs of production.

The Western Gas Engine & Schaafe Machine Works, Seattle, has been formed as a consolidation of the companies named in its title.

The Sumner Iron Works, Everett, Wash., has met with a large demand this season for its new type of horizontal high pressure tubular boiler, which is now installed in many plants of the Northwestern States, as well as in British Columbia.

A large steam turbine of the Parsons type, with alternating current generator direct coupled, is now being added to the power equipment of the Panhandle Lumber Company at Ione, Wash.

The Clarkston Box Factory, Clarkston, Wash., is planning and addition which will double its capacity. Operating machinery and probably electric motors will be purchased.

A low pressure steam turbine of 750 hp., to operate on the exhaust from a Corliss engine power plant, with direct coupled generator and about 20 alternating current motors ranging in size up to 150 hp. or more, will be provided for the mill of the Kleeb Lumber Company, South Bend, Wash., the machinery in which is to be electrically operated throughout.

A new foundry and machine shop for the Sedro-Woolley Iron Works, Sedro-Woolley, Wash., whose plans were referred to some months back, are practically completed and will furnish far better facilities for custom work than were comprised in the buildings which burned.

Henceforth the business of the National Wood Pipe Company, Portland, Ore., will be consolidated with that of the Pacific Tank Company, Los Angeles, under the name of the Pacific Tank & Pipe Company. Offices are to be maintained at San Francisco as well as in the cities named.

The Fess System Company, San Francisco, has recently made a large number of sales of its special apparatus for oil burning furnaces in power and heating plants. The method used, which includes a small motor driven air compressor, is well worth investigation by owners of such plants.

Improvements involving an expenditure of \$1,000,000 or more, including the purchase of additional generating units, have been decided upon by the San Diego Consolidated Gas & Electric Company, San Diego, Cal.

An electric power unit of 100 hp., with exciter dynamo, switchboard and auxiliary equipment, will be installed by the Minor Mill & Lumber Company, Arcata, Cal., at some time within the next few months.

Some additional machinery will be purchased this year for the generating system of the Amador Electric Light & Power Company, Jackson, Cal. Definite plans, however, have not yet been determined upon.

Another plant will be added to the industries of Bellingham, Wash., by the decision of the Burton Saw Company, Vancouver, B. C., to establish a factory there. No announcement in relation to equipment has been thus far made.

The Clay Products Company, Spokane, Wash., recently organized, will proceed this spring with the erection of a plant of considerable size, equipped with power machinery, presses and other apparatus for tile and pipe making.

The Michigan Mining Company, Orient, Wash., will install an air compressor and drills for driving a 700-ft. tunnel through its property. Other equipment will also be needed during the year as shafts are opened.

A very active season has been experienced since the first of the year by the Reynolds Electric Company, Seattle, in installing power plants for use by various industrial establishments. This concern takes complete contracts for the sale and connecting up of machinery, turning a plant over to the owner in full operating order.

The Oregon Electric Company, Portland, will establish a crushing plant at Tonquin, Ore., which lies in the vicinity of that city, to supply ballast and macadam to the territory served by its traction lines. Quarry equipment, including compressors, drill, larries, electric haulers, gyratory breaker, elevator, screens, &c., will be required.

A factory equipped with power unit, motors and wood-working machinery will be built at Fremont, Wash., by the Washington Interior Finishing Company.

The Bothwell Electric Company, Bothwell, Wash., has been organized to establish a public service plant, machinery for which will be needed shortly.

The Tacoma Ornamental Iron & Wire Works, Tacoma, Wash., will carry on a plant for the manufacture of metal specialties used in construction work.

An electric generating unit to serve the shops and yards at La Grande, Ore., particularly for lighting, will be installed this summer by the Oregon Railroad & Navigation Company.

The Schwager-Nettleton Mills, Seattle, Wash., has let the contract for two horizontal steam turbines of 500 kw. each to be furnished by the General Electric Company, Schenectady, N. Y.

The construction of a municipal water works system is under consideration at Calexico, Cal.

The Los Angeles & Mount Washington Railway, Los Angeles, Cal., whose plans for a power plant were alluded to by *The Iron Age* last fall, will soon be ready to consider the purchase of equipment. Machine tools for repair work will also be needed.

The Stetson-Ross Machine Works, Seattle, has recently made some very heavy sales of machinery for mills on both sides of the boundary, and prospects for business continue excellent.

A crushing plant equipped with 10 stamps is to be installed by the Farmers Mining Company, Palisade, Nev., together with motive power and other machinery.

With increased facilities recently provided, the J. E. Fox Saw Works, Seattle, has entered upon a season of production which eclipses that of any previous year and further shop extensions are likely to result.

The Portland Mfg. Company, St. John, Ore., which was destroyed by fire some time ago, is being rebuilt on an enlarged scale. Among the new buildings being erected is a power house 26 x 50 ft., in which will be installed boilers of 150 hp. capacity and engines of 100 hp.; there will also be one 50-hp. motor and several smaller ones distributed through the various departments. A sprinkling system will be installed for fire protection, and the entire cost of buildings and machinery will be about \$60,000.

The Portland Railway, Light & Power Company, Portland, Ore., has appropriated \$5,080,000 for extensions and improvements to be made this year, over half of which is to provide power and operating facilities. Among the orders at present being placed is one for a hydroelectric unit of 500 kw. capacity and more will follow in the near future.

The Tejuanga Rock Company, Los Angeles, Cal., is taking figures for erecting a rock crushing plant with 12 bins of 4000 cubic yards capacity, and the installation of crushing machinery, gas engines and conveyor belts.

Government Purchases.

WASHINGTON, April 5, 1910.

William M. Smith, acting chief of bureau of yards and docks, Navy Department, Washington, will receive bids until April 30 for a condenser plant at the navy yard, Boston, Mass.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids April 19 for the following: Schedule 2377, 12 light chipping hammers, 12 medium chipping hammers, 24 pneumatic drilling machines; schedule 2367, one motor-driven engine lathe. On April 26, schedule 2370, one air compressor accumulator outfit and one air locomotive.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids March 29 for the following:

Class 11.—Two motor driven boring and turning mills—Bidder 12, Henshaw, Bulkley & Co., San Francisco, Cal., \$2540 and \$2440; 63, Niles-Bement-Pond Company, New York, \$2870; 72, Pacific Tool & Supply Company, San Francisco, \$2290.

Class 12.—One cold metal sawing machine—Bidder 37, Harron, Ricard & McCone, San Francisco, \$839; 72, Pacific Tool & Supply Company, San Francisco, Cal., \$1025; 91, Tindall, Morris Company, Eddystone, Pa., \$1416.

Class 72.—One plain milling machine—Bidder 2, Brown & Sharpe Mfg. Company, Providence, R. I., \$1580.65 and \$1318.65; 17, Cincinnati Milling Machine Company, Cincinnati, Ohio, \$1584.

The Tropenas Steel Casting Company, New Castle, Del., has been adding considerable labor saving equipment to its plant. An industrial railway has been installed, which serves practically all departments. This company will in future give considerable attention to the manufacture of special steel alloy castings.

Labor Notes.

The boards of directors of railroads comprising the Pennsylvania System have ordered a voluntary advance of 6 per cent., effective April 1, in the wages of all permanent employees of the company who now receive less than \$300 per month. This is the third general voluntary increase in wages granted by the Pennsylvania System in the last eight years. The Pennsylvania Railroad and its affiliated lines employ about 200,000 men. Of these, approximately 195,000 will participate in the increase of wages. This will involve an addition of some \$10,000,000 to the pay rolls of the various companies. The Pennsylvania Railroad has not made a general reduction of wages since May, 1877, when reduced earnings made a 10 per cent. decrease necessary. This was restored in March, 1880, however, and the employees have since that time enjoyed constant and undiminished wages in spite of the business depressions which have on a number of occasions caused reductions by many corporations.

A Bethlehem, Pa., dispatch says that in pursuance of the promise made by President Schwab of the Bethlehem Steel Company to consider the grievances of dissatisfied employees after their return to work, an announcement was made April 2 of an increase of 1 cent an hour to common laborers, making the rate 13½ cents an hour. Puddlers' wages have been advanced 50 cents a ton. The Town Council at South Bethlehem, by a vote of 9 to 6, has refused the striking employees of the Bethlehem Steel Company the further use of the Municipal Building for holding meetings. This action followed the sending out of letters by the labor leaders to members of Congress and to Representatives of foreign Governments, attempting to make trouble for the company in connection with existing contracts between the steel company and various Governments.

The Thomas Carlin's Sons Company.—This company, with offices and plant at 1600 River avenue, N. S., Pittsburgh, reports that it is operating its foundry and machine shops to full capacity, and that prospective work will insure steady operations for some time ahead. Contracts recently booked include one Carlin 9-ft. automatic belted wet pan for the Buckeye Steel Casting Company, Columbus, Ohio; a No. 5 shear, motor driven, to cut 2 x 8 in., for Bellaire Works of the Carnegie Steel Company; a No. 18 shear to cut 2¼ in. square and one 15-hp. two-phase induction motor for the Carpenter Steel Company, Reading, Pa.; three additional feed water heaters for the Jamison Coal & Coke Company, Greensburg, Pa.; two No. 18 shears, to cut 2¼-in. material, with 15-hp. General Electric motor, and one No. 38 shear, to cut 1¾ in. square, with 10-hp. General Electric motor, for the Blue Island Rolling Mill & Car Company, West Pullman, Ill.; in addition to numerous smaller shears, wet pans and a lot of foundry and plate work, such as tanks, steel structures, &c.

The Willet Engine & Carbureter Company, Buffalo, N. Y., has increased its capital stock to \$1,000,000, and will build and equip a new and much larger plant for the manufacture of the Willet two-cycle gasoline engine, in various types, for automobiles and marine and stationary use, and aeroplanes. The Willet perfected multiple jet carbureter will also be produced in large quantities, and the company will add a department for the manufacture of commercial vehicles, specializing the 1000-lb. delivery wagon. The executive offices of the company are at 420 Prudential Building. Wm. G. Colwell, formerly with the Columbus Buggy Company and the South Bend Iron Works, and Albert F. Brown, formerly of the Westinghouse Company, are interested in the reorganized company. J. D. Willet is president.

The Clearing House

Beginning with this issue, one of the most useful departments of THE IRON AGE appears under a new name. We mean the pages devoted to special notices, for sale and want ads., etc. This section, usually referred to heretofore as the Second-Hand Machinery Department, will in future be known as "The Clearing House." See pages 142 to 154 of this issue.

For a great many years this department has been one of the best known features of THE IRON AGE. From a small beginning it has grown gradually and consistently until now it contains in every issue from twelve to fifteen pages of attractive offerings of second-hand machinery and supplies, including almost all kinds of Factory, Mill and Railroad equipment.

Why did we choose "The Clearing House" as a name for this department? Simply because this name expresses EXACTLY what the Second-Hand Machinery section has grown to be. We selected these three words because years of success as a RESULT-PRODUCING MEDIUM for advertisers of second-hand equipment have proven that this department is the NATIONAL Clearing House for every variety of such material.

For fifty-five years, THE IRON AGE has been an indispensable "silent partner" to thousands of Presidents, Managers and Purchasing Agents of representative Iron and Steel Mills, Manufacturers of Machinery and Metal Products, Railroads, Contractors, etc.

Its readers consult it every week for information NECESSARY in the conduct of their business. Isn't it natural that they should also consult it as a matter of course whenever they are in the market for new or second-hand machinery, equipment or supplies?

Make it a habit to read the advertisements in "The Clearing House" every week. You may find a money-saving opportunity that will easily repay you for your time. Perhaps you have second-hand machinery or equipment that you would like to dispose of; or you may have a machinery want to satisfy. In either case, your best investment is an advertisement in "The Clearing House."

We would like to send you conclusive PROOF that advertisements in The Iron Age BRING RESULTS. May we do so?

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—		Corrugated Roofing—		METALS—	
Bar Iron from store—		2½ in. corrugated.		Tin—	
Refined Iron—		No. 24.....	Painted Galvd.	Straits Pig.....	
1 to 1½ in. round and square.....		No. 26.....	100 sq. ft. \$3.85	Copper—	
1½ to 2 in. x ¼ to 1 in.....		No. 28.....	100 sq. ft. 2.95	Lake Ingot.....	
1½ to 2 in. x ¼ to 1 in.....			100 sq. ft. 2.60	Electrolytic.....	
Rods—¼ and 11-16 round and square.....				Castings.....	
Angles.....				Sheet Copper Hot Rolled, 16 oz (quantity lots).....	
3 in x ¼ in. and larger.....				Sheet Copper Cold Rolled, 16 oz in advance over Hot Rolled.....	
3 in x 3-16 in. and ¼ in.....				Sheet Copper Polished 20 in. wide and under, 16 oz square foot.....	
1½ to 2 in. x ¼ in.....				Sheet Copper Polished over 20 in. wide, 20 oz square foot.....	
1½ to 2 in. x 3-16 in. and thicker.....				Planished Copper, 16 oz square foot more than Polished.....	
1 to 1½ in. x 3-16 in.....				Spelter—	
1 to 1½ in. x ¼ in.....				Western.....	
¾ x ¼ in.....				Zinc.	
¾ x ¼ in.....				No. 9, base, cracks.....	
¾ x ¼ in.....				Lead.	
Teas.	1 in.....	Tin Plates—		American Pig.....	
	1½ in.....	"A.A.A." Charcoal:		Bar.....	
1½ to 2 in. x ¼ in.....		IC, 14 x 20.....		Solder.	
1½ to 2 in. x 3-16 in. and thicker.....		IX, 14 x 20.....		½ & ¾, guaranteed.....	
1 to 1½ in. x 3-16 in.....		A. Charcoal.....		Refined.....	
1 to 1½ in. x ¼ in.....		IC, 14 x 20.....		Prices of Solder indicated by private brand vary according to composition.	
¾ x ¼ in.....		IX, 14 x 20.....		Antimony—	
¾ x ¼ in.....		American Coke Plates—Bessemer—		Cookson.....	
¾ x ¼ in.....		1 14 x 20.....		Hallett.....	
¾ x ¼ in.....		IX, 14 x 20.....		Other Brands.....	
¾ x ¼ in.....		American Terne Plates—		Bismuth—	
¾ x ¼ in.....		IC, 20 x 28 with an 8 lb. coating.....		Per. lb.....	
¾ x ¼ in.....		IX, 20 x 28 with an 8 lb. coating.....		Aluminum—	
¾ x ¼ in.....		Bolts—		No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting.....	
¾ x ¼ in.....		Carriage, Machine, &c.—		Rods & Wire.....	
¾ x ¼ in.....		Common Carriage (cut thread):		Sheets.....	
¾ x ¼ in.....		¾ x 6 and smaller.....		Old Metals.	
¾ x ¼ in.....		Larger and longer.....		Dealers' Purchasing Prices Paid in New York	
¾ x ¼ in.....		Common Carriage (rolled thread):		Copper, Heavy cut and crucible.....	
¾ x ¼ in.....		¾ x 6, smaller and shorter.....		Copper, Heavy and Wire.....	
¾ x ¼ in.....		Phila. Eagle, \$3.00 list.....		Copper, Light and Bottoms.....	
¾ x ¼ in.....		Bolt ends with C. & T. Nuts.....		Brass, Heavy.....	
¾ x ¼ in.....		Machine (Cut Thread):		Brass, Light.....	
¾ x ¼ in.....		¾ x 4 and smaller.....		Heavy Machine Composition.....	
¾ x ¼ in.....		Larger and longer.....		Clean Brass Turnings.....	
¾ x ¼ in.....		Nuts		Composition Turnings.....	
¾ x ¼ in.....		Blank or Tapped.....		Lead, Heavy.....	
¾ x ¼ in.....		Cold Punched:		Lead, Tea.....	
¾ x ¼ in.....		Square.....		Zinc Scrap.....	
¾ x ¼ in.....		Hexagon.....			
¾ x ¼ in.....		Square, C. T. & R.....			
¾ x ¼ in.....		Hexagon, C. T. & R.....			
¾ x ¼ in.....		Hot Pressed.....			
¾ x ¼ in.....		Square.....			
¾ x ¼ in.....		Hexagon.....			
¾ x ¼ in.....		Seamless Brass Tubes—			
¾ x ¼ in.....		List November 13, 1908.....			
¾ x ¼ in.....		Brass Tubes, Iron Pipe Sizes—			
¾ x ¼ in.....		List November 13, 1908.....			
¾ x ¼ in.....		Copper Tubes—			
¾ x ¼ in.....		List November 13, 1908.....			
¾ x ¼ in.....		Braided Brass Tubes—			
¾ x ¼ in.....		List August 1, 1908.....			
¾ x ¼ in.....		High Brass Rods—			
¾ x ¼ in.....		List August 1, 1908.....			
¾ x ¼ in.....		Roll and Sheet Brass—			
¾ x ¼ in.....		List August 1, 1908.....			
¾ x ¼ in.....		Brass Wire—			
¾ x ¼ in.....		List August 1, 1908.....			
¾ x ¼ in.....		Copper Wire—			
¾ x ¼ in.....		Base Price.....			

THE IRON AGE

Established 1855

The oldest paper in the world devoted to the interests of the Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

Issued Every Thursday Morning

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Newdealers or Booksellers in any part of the world may obtain The Iron Age and Iron Age-Hardware through the American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or the San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

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PUBLICATION OFFICE, 14-16 PARK PLACE, NEW YORK